Barking Sands Underwater Range Expansion (BSURE) Refurbishment

Final Record of Categorical Exclusion/Overseas Environmental Assessment

March 2008

DEPARTMENT OF THE NAVY
# Acronyms and Abbreviations

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<tr>
<td>ASW</td>
<td>Anti-Submarine Warfare</td>
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<tr>
<td>BARSTUR</td>
<td>Barking Sands Tactical Underwater Range</td>
</tr>
<tr>
<td>BiDi-Hi</td>
<td>Bi-directional, high frequency</td>
</tr>
<tr>
<td>BiDi-Lo</td>
<td>Bi-directional, low frequency</td>
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<tr>
<td>BMP</td>
<td>Best Management Practice</td>
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<tr>
<td>BSURE</td>
<td>Barking Sands Underwater Range Expansion</td>
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<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
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<tr>
<td>cm</td>
<td>centimeter(s)</td>
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<tr>
<td>CTB</td>
<td>Cable Termination Building</td>
</tr>
<tr>
<td>dB, dBA</td>
<td>decibels, A-weighted decibels</td>
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<td>DoN</td>
<td>Department of the Navy</td>
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<tr>
<td>EFH</td>
<td>Essential Fish Habitat</td>
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<tr>
<td>EIS</td>
<td>Environmental Impact Statement</td>
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<tr>
<td>EO</td>
<td>Executive Order</td>
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<tr>
<td>ESA</td>
<td>Endangered Species Act</td>
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<td>FMP</td>
<td>Fishery Management Plan</td>
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<tr>
<td>FOIA</td>
<td>Freedom of Information Act</td>
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<tr>
<td>FRTP</td>
<td>Fleet Readiness Training Plan</td>
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<tr>
<td>ft</td>
<td>foot/feet</td>
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<tr>
<td>ha</td>
<td>hectare(s)</td>
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<tr>
<td>HAPC</td>
<td>Habitat Area of Particular Concern</td>
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<td>HDD</td>
<td>Horizontal Directional Drilling</td>
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<tr>
<td>ICRMP</td>
<td>Integrated Cultural Resources Management Plan</td>
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<td>ICP</td>
<td>Installation Contingency Plan</td>
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<td>INRMP</td>
<td>Integrated Natural Resources Management Plan</td>
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<td>IWS</td>
<td>In-Water System</td>
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<tr>
<td>J-box</td>
<td>Junction box</td>
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<td>km</td>
<td>kilometer(s)</td>
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<tr>
<td>LOS</td>
<td>Level of Service</td>
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<tr>
<td>LCE</td>
<td>Linear Cable Engine</td>
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<tr>
<td>m</td>
<td>meter(s)</td>
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<tr>
<td>mi</td>
<td>mile(s)</td>
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<tr>
<td>MASA</td>
<td>Mobilization And Staging Area</td>
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<td>MBARI</td>
<td>Monterey Bay Aquarium Research Institute</td>
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<td>MMPA</td>
<td>Marine Mammal Protection Act</td>
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<td>MSFCMA</td>
<td>Magnuson-Stevens Fishery Conservation and Management Act</td>
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<td>NEPA</td>
<td>National Environmental Policy Act</td>
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<td>NMFS</td>
<td>National Marine Fisheries Service</td>
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<td>NOAA</td>
<td>National Ocean and Atmospheric Administration</td>
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<td>NPDES</td>
<td>National Pollutant Discharge Elimination System</td>
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<td>NPS</td>
<td>Non-Point Source</td>
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<td>NUWC</td>
<td>Naval Undersea Warfare Center</td>
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<td>NWI</td>
<td>Northwestern Hawaiian Islands</td>
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<td>OEA</td>
<td>Overseas Environmental Assessment</td>
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<td>OSS</td>
<td>Ocean Sensor System</td>
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<td>PMRF</td>
<td>Pacific Missile Range Facility</td>
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<td>PRIA</td>
<td>Pacific Remote Island Areas</td>
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<td>SES</td>
<td>Shore Electronics System</td>
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<td>SOAR</td>
<td>Southern California Anti-Submarine Warfare Range</td>
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<td>SHPO</td>
<td>State Historic Preservation Officer</td>
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<td>SWPPP</td>
<td>Storm Water Pollution Prevention Plan</td>
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<td>SWTR</td>
<td>Shallow Water Training Range</td>
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<tr>
<td>UCS</td>
<td>Underwater Communication System</td>
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<tr>
<td>Uni</td>
<td>Uni-directional</td>
</tr>
<tr>
<td>USACE</td>
<td>U.S. Army Corps of Engineers</td>
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<tr>
<td>USC</td>
<td>U.S. Code</td>
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<tr>
<td>USFWS</td>
<td>U.S. Fish and Wildlife Service</td>
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<tr>
<td>UTR</td>
<td>Underwater Tracking Range</td>
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<tr>
<td>UWT</td>
<td>Underwater Telephone</td>
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<td>WPFMC</td>
<td>Western Pacific Fishery Management Council</td>
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RECORD OF CATEGORICAL EXCLUSION/OVERSEAS ENVIRONMENTAL ASSESSMENT

Lead Agency: Department of the Navy

Title of Proposed Action: Barking Sands Underwater Range Expansion (BSURE) Refurbishment

Location: Pacific Missile Range Facility, from Barking Sands to 40 nautical miles (nm) offshore Kauai, Hawaii

Designation: Record of Categorical Exclusion/Overseas Environmental Assessment

Abstract

The Naval Air Systems Command proposes the refurbishment of the Barking Sands Underwater Range Expansion (BSURE) at the Pacific Missile Range Facility (PMRF), located in waters off the Island of Kauai, Hawaii. The proposed refurbishment is needed to sustain the capability of BSURE to support anti-submarine warfare training. The refurbishment consists of the installation of two fiber optic “trunk” cables into underground pipes by directional drilling from a previously used onshore construction site at PMRF to an underwater junction box (J-box). One of the trunk cables would be connected to the J-box, whereas the second would be secured to the seabed for future use if needed. From the J-box, four fiber optic “array” cables with multiplexed sensors would be laid seaward into the existing training/coverage area of BSURE, with the sensors deployed in depths greater than 4,000 feet (ft) and extending approximately 42 nm offshore. The Proposed Action is limited to the installation and testing of the equipment. All operational use of BSURE is addressed in the Hawaii Range Complex Environmental Impact Statement (EIS)/Overseas EIS currently in preparation. This integrated Record of Categorical Exclusion (CATEX)/Overseas Environmental Assessment (OEA) has been prepared to address the requirements of the National Environmental Policy Act (NEPA) as it applies within and including the 12 nm limit of the U.S. Territorial Seas, and Executive Order (EO) 12114, “Environmental Effects Abroad of Major Federal Actions” for components of the Proposed Action beyond the 12 nm limit. Implementation of the Proposed Action is not anticipated to result in significant impacts to the environment under NEPA or significant harm to the environment of the global commons under EO 12114. Based on the analysis contained in the Record of CATEX/OEA, the portion of the Proposed Action that will occur within and including the 12 nm limit is categorically excluded from further NEPA documentation requirements, and for the portion beyond 12 nm, no Overseas EIS is required.

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EXECUTIVE SUMMARY

The Naval Air Systems Command proposes to refurbish the existing capability of the Barking Sands Underwater Range Expansion (BSURE). BSURE is an essential component of the Pacific Missile Range Facility (PMRF) and provides over 80% of PMRF’s underwater tracking capability. The existing BSURE consists of eighteen hydrophones on two multiplexed cables and two underwater telephones (UWTs), each independently cabled. There are four coaxial cables that total approximately 125 nautical miles (nm) in length. The BSURE tracking area is approximately 9 to 42 nm from shore, in water depths of roughly 6,000 to 15,000 feet (ft) (1,800 to 4,500 m). The Proposed Action is needed because the existing equipment has reached the end of its design life; sections of BSURE have already failed. A failure of either of the two (2) BSURE arrays will shut down underwater tracking over the entire BSURE range. The No Action alternative would lead to an increasingly likely event of sudden, complete failure. If this occurred, Mid-Pacific Fleet Submarine Training would be severely curtailed and additional repair actions would be needed.

The Proposed Action includes components onshore at PMRF and offshore within and including the 12 nm limit, which are subject to the National Environmental Policy Act (NEPA); and components in the open ocean (overseas) environment beyond 12 nm, which are subject to Executive Order (EO) 12114, “Environmental Effects Abroad of Major Federal Actions.” This integrated Record of Categorical Exclusion (CATEX)/Overseas Environmental Assessment (OEA) has been prepared to address both NEPA and EO 12114 requirements.

The Proposed Action is limited to the installation and testing of the equipment. All operational use of BSURE is addressed in the Hawaii Range Complex Environmental Impact Statement (EIS)/Overseas EIS currently in preparation. There would be no increase in the coverage area or increase in training operations tempo associated with this action. The existing cables, transducers, and repeaters will continue to be used for underwater tracking purposes until the existing system degrades or fails. The need to remove non-functional equipment, and how best to execute that, would be evaluated when necessary in the future.

The proposed action includes the installation of four parallel fiber optic “array” cables with multiplexed uni- and bi-directional sensors; these cables would be laid on the seabed in the existing training area of BSURE alongside the existing cable infrastructure. The sensors would be located from about 42 nm from shore to about 11 nm from shore. The four cables would be connected to a junction box (J-box) located about 5,000 ft (1,500 m) from shore in about 80 ft (24 m) of water depth in the same general area as existing cables and junction boxes. Two underground pipes would be installed to the location of the J-box by horizontal directional drilling (HDD) from a previously disturbed onshore construction site. A fiber optic trunk cable would be pulled onshore through each pipe. Onshore the trunk cables would be laid in existing conduits and cable vaults and terminated at the Cable Termination Building (CTB), Building 410 at PMRF. One of the trunk cables would be connected to the J-box, whereas the second would be secured to the seabed for future use if needed. Installation would begin no earlier than April 2009.

Potential effects of the Proposed Action on the physical and biological environment, including the effects of refurbishment activities on geology, water quality, biological resources, cultural resources, and land and water use, have been evaluated in this Record of CATEX/OEA. Implementation of the Proposed Action would not result in significant impacts to the environment under NEPA or significant harm to the environment of the global commons under EO 12114. The BSURE refurbishment falls under the
following type of action which has been determined to qualify for a CATEX under SECNAVINST 5090.6A, Enclosure (1) paragraph 5.e:

(34) New construction that is similar to existing land use and, when complete, the use or operation of which complies with existing regulatory requirements (e.g., a building within a cantonment area with associated discharges/runoff within existing handling capabilities).

Therefore, the Proposed Action is categorically excluded from further NEPA documentation requirements, and for the portion beyond 12 nm, no Overseas EIS is required.
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CHAPTER 1
INTRODUCTION

1.1 INTRODUCTION
The Naval Air Systems Command proposes to refurbish the existing capability of Barking Sands Underwater Range Expansion (BSURE). The proposed refurbishment would sustain the capability of BSURE to support anti-submarine warfare (ASW) training. The refurbishment would involve project components at the Pacific Missile Range (PMRF) onshore and offshore within the 12 nautical mile (nm) limit of the U.S. territorial seas. These components of the Proposed Action are subject to the requirements of the National Environmental Policy Act (NEPA). Although these components are necessary to the refurbishment, the BSURE underwater tracking area is almost entirely in the open ocean environment, more than 12 nm from shore. The open ocean components are subject to the requirements of Executive Order (EO) 12114, “Environmental Effects Abroad of Major Federal Actions,” which directs federal agencies to assess the impacts of their activities beyond the 12-nm limit of the U.S. territorial seas. Consistent with the Navy Environmental and Natural Resources Program Manual (OPNAVINST 5090.1C, 30 October 2007), analyses of the Proposed Action’s environmental effects have been combined herein, in a single integrated document to meet the requirements of both NEPA and EO 12114.

For the portion subject to NEPA, the BSURE refurbishment falls under the following type of action which has been determined to qualify for a Categorical Exclusion (CATEX) under SECNAVINST 5090.6A, Enclosure (1) paragraph 5.e:

(34) New construction that is similar to existing land use and, when complete, the use or operation of which complies with existing regulatory requirements (e.g., a building within a cantonment area with associated discharges/runoff within existing handling capabilities).

For the overseas components, an Overseas Environmental Assessment (OEA) is the appropriate document to determine whether or not the action would cause significant harm to the environment beyond 12 nm. Accordingly, this integrated document is referred to as a Record of CATEX/OEA.

The Pacific Missile Range Facility (PMRF) at Barking Sands, Kauai, Hawaii is the world’s largest instrumented, multi-dimensional testing and training range. PMRF includes underwater ranges that provide tracking coverage over approximately 1,100 nm² in the waters offshore Kauai. BSURE covers 900 nm², encompassing the deep-water area of PMRF and providing over 80% of the PMRF underwater tracking coverage (Figure 1-1). Remaining coverage is provided by the Barking Sands Tactical Underwater Range (BARSTUR), and the Shallow Water Training Range (SWTR). The BSURE tracking area and instruments are 9 to 40 nm from shore, in water depths of 6,000 to 15,000 feet (ft) (1,800 to 4,500 meters [m]). The existing BSURE consists of 18 hydrophones on two multiplexed cables, and two underwater telephones (UWTs [UCS-1 and UCS-2 in Figure 1-1]), which are each independently cabled. There currently are a total of four coaxial cables with a total length of approximately 125 nm; the cables run to shore and are connected into a data processing facility at Barking Sands.

The Navy proposes to refurbish BSURE. Refurbishment will not increase the number of range uses, type, or tempo of training activity at PMRF. Refurbishment would prevent the disruptions associated with age-
related failures of the existing equipment, allowing continued utilization of the range for ASW training. The existing equipment will be left in place and available for redundant (backup) use until it fails.

The refurbishment would include the installation of new array cables and associated uni- and bi-directional sensors within the existing deep-water area of BSURE, alongside the existing infrastructure. Actions which occur beyond 12 nm include deployment of the offshore cable arrays and sensors. The new array cables would connect to an underwater junction box (J-box) in the nearshore waters. Trunk cables, one connecting to the arrays at the J-box, the second secured in place for future use if needed, would be routed to shore through underground pipes installed by horizontal directional drilling (HDD) from an onshore construction site. The cables would be connected to a new shore electronics system (SES) at the cable termination building (CTB), building 410, at Barking Sands, Kauai. Trunk cables, HDD routes, and the J-box would be located within 12 nm of the shoreline and are analyzed along with onshore construction in accordance with the National Environmental Policy Act (NEPA).

![Figure 1-1 Regional Location - BSURE and PMRF, Kauai, Hawaii](image)

The BSURE refurbishment project would provide a redundant tracking and communications capability that would prevent the disruptions that would be associated with age-related failures of the existing equipment, allowing continued utilization of the range for anti-submarine warfare (ASW) training. The new system of four arrays and 41 sensors would be placed with less cable length (distance) between each sensor. This closer spacing of the sensors would keep the coverage area the same as the current two-array system, but the area would be more densely populated with sensors. In the event of an array failure and the loss of sensors, exercises would continue with little adverse effect. The existing equipment would
also be left in place for continued use and operated concurrently (i.e., redundantly) with the existing capability within the existing 900 nm² instrumented area. The older equipment would continue to be used, initially to confirm that the new equipment is operating, and thereafter in a backup capacity, until it fails. There will be no increase in the coverage area or increase in training operations tempo associated with this action.

1.2 PURPOSE AND NEED

BSURE is vital to the support of continued safe and effective ASW training. Hence the purpose of the Proposed Action is to sustain the capability of BSURE to support ASW. BSURE previously underwent major repairs in 1984, 1997, and 2001. The Proposed Action would refurbish the existing capability of BSURE. There would be no increase in the coverage area or increase in training operations tempo associated with this action. The replacement technology would utilize electro-optical cables and contain modern telecommunications electronics. The existing cables, transducers, and repeaters would continue to be used for underwater tracking purposes until the system degrades or fails.

The Proposed Action is needed because the sensors are 22 years old, the cables are 27 years old, and the technology is 30 years old. By all engineering measures, it has reached the end of its design life; sections of BSURE have already failed. The UWT system was installed in 1981. UWT North failed in 1997, and was replaced in 2001. BSURE will not degrade gracefully due to its architecture. A failure of either of the two (2) BSURE arrays will shut down underwater tracking over the entire BSURE range, or 80% of PMRF tracking coverage.

1.3 SCOPE OF THE INTEGRATED DOCUMENT

Impacts that would occur within and outside the U.S. territorial sea are contained in separately identified subsections of the document. Resources analyzed in this document include components of the physical and biological environment that are of potential interest or concern within the area of proposed refurbishment activities. For the NEPA-Record of CATEX portion, which addresses components onshore and offshore at PMRF within and including the 12 nm limit, this includes geology and soils, water quality, biological resources, cultural resources, and land and water use. For the OEA portion, which addresses components greater than 12 nm from shore, this includes marine geology, water quality, and biological resources.

A number of issue areas have not been carried forward for detailed analysis in this document since brief consideration is sufficient to conclude potential impacts would be negligible and/or clearly insignificant. Issues not addressed further are as follows.

- **Air Quality.** The entire State of Hawaii is in attainment of the Federal and State ambient air quality standards established for all criteria pollutants. Consequently, Clean Air Act applicability analysis and conformity determination do not apply to Navy actions in Hawaii. Project related emissions would be temporary and limited to the generation of fugitive dust and the by-products of petroleum fuels combustion. Emissions would be well below National Emissions Standards for Hazardous Air Pollutants and below thresholds requiring a Prevention of Significant Deterioration. Air quality in the overseas project area is relatively pristine. There are no applicable regulatory thresholds for temporary, mobile emissions from vessels beyond 12 nm offshore Hawaii, and short-term vessel emissions from project-related activities would be rapidly dispersed.

- **Airspace.** The Proposed Action does not involve the use of, or otherwise affect, airspace.
• **Cultural Resources (>12 nm).** No submerged cultural resources are known, nor are they likely to be present in the deep waters of the offshore installation area.

• **Hazardous Materials and Waste.** Other than petroleum-based fuel and lubricants onboard vessels engaged in the refurbishment, there are no hazardous materials associated with the Proposed Action. Adherence to standard Navy requirements for pollution prevention and for spill containment, cleanup, and reporting in the offshore waters minimizes the likelihood of a fuel or lubricant spill and any adverse consequences.

• **Health and Safety.** The Proposed Action poses no risks to public health or safety. No unexploded ordinance is known or suspected to exist in the onshore or offshore work areas. The action would be similar to activities that regularly occur on PMRF and in the offshore waters, and do not involve the generation of hazardous materials or circumstances.

• **Land and Water Use (>12 nm).** The offshore waters containing BSURE are not restricted from public use, but their use is limited by the fact that they are within a warning area, W-188, where military training exercises that are potentially hazardous to the public occur on a continuous basis. Non-participating vessels are warned to avoid specified areas and activities through Notice to Mariners and PMRF ensures that hazard areas are cleared prior to each exercise.

• **Socioeconomic Issues.** The Proposed Action is a short-term installation project which would not have any socioeconomic effects on the surrounding communities. No parks, agricultural lands, or public transportation would be affected. EO 12114 does not apply to social or economic effects, which would not occur in any case due to the location of the Proposed Action in the offshore waters of the BSURE tracking area.

• **Utility Services.** The Proposed Action will not require utility services (water, electricity, sewerage, etc.) beyond the available capacity of existing utility services.

Because BSURE is an established underwater range dedicated to ongoing ASW training, the scope of feasible alternatives is limited to either maintaining the range and training capability, as the Proposed Action would do, or allowing the range and training capability to degrade, as would occur if no action were taken. Therefore, this document evaluates the environmental effects of the Proposed Action and a No-Action Alternative.
CHAPTER 2
PROPOSED ACTION

2.1 OVERVIEW

The Proposed Action is to refurbish the BSURE underwater tracking range (UTR) by installing a new ocean sensor system (OSS) and shore electronics system (SES). The Proposed Action involves temporary construction activity at PMRF onshore and offshore, as well as the deployment of underwater cables along existing routes in the open ocean environment to approximately 40-nm from Kauai.

Refurbishment includes the installation of undersea cables with hydrophone and underwater telephone (UWT) sensors to sustain the capabilities of the BSURE. Hydrophones are used to convert acoustic energy into electrical energy, and are used to receive sounds on the range. UWTs are used for underwater communications. A node is defined as the acoustic and electronic package that is deployed on the sea floor and contains one or two sensors. A node containing a single hydrophone sensor is referred to as unidirectional. A node containing two sensors (hydrophone and UWT) is referred to as bi-directional. Several nodes and the associated cabling form an array.

The new in-water system (IWS) would provide sufficient instrumentation to maintain existing UWT coverage and hydrophone tracking capability within the existing instrumented area. The new IWS would be operated concurrently (i.e., redundantly) with the existing capability within the existing 900 nm\(^2\) instrumented area. Refurbishment of the OSS and SES would provide range coverage with both the old sensor nodes and the new sensor nodes while the new system undergoes certification. After certification is complete, the old sensors would be used as a backup system. There would be no increase in the coverage area or increase in training operations tempo associated with this action. The need to remove the existing equipment, and how best to execute that, would be evaluated when necessary in the future.

The proposed action includes the installation of four parallel fiber optic “array” cables with multiplexed uni- and bi-directional sensors; these cables would be laid on the seabed in the existing training area of BSURE alongside the existing cable infrastructure. The sensors would be located from about 42 nm to about 11 nm from shore. The four cables would be connected to a junction box (J-box) located about 5,000 ft (1,500 m) from shore in about 80 ft (24 m) of water depth in the same general area as existing cables and junction boxes. Two underground pipes would be installed using horizontal directional drilling (HDD) from the J-box to a previously disturbed, onshore construction site. Two fiber optic trunk cables, one connected to the j-box, the other secured to the seabed for future use if needed, would be pulled onshore though the pipes. Onshore the trunk cables would be laid in existing conduits and cable vaults and terminated at the Cable Termination Building (CTB), Building 410 at PMRF. A total of 41 sensors, 39 of which would be more than 12 nm from shore, would be installed.

Additional details are provided below.

2.2 DESCRIPTION OF THE PROPOSED ACTION

2.2.1 Project Design

BSURE refurbishment consists of several project design elements. Figure 2-1 depicts the location of nearshore project components on the west side of Kauai. Detailed design elements are described in the sections that follow. A summary of these elements is as follows:
- Onshore Installation. An onshore construction site would be located in a previously disturbed area work area at PMRF.

- Horizontal Directional Drilling. HDD would be used to protect the trunk cables in the on shore and near shore underwater area up to a depth of about 80 ft.

- Underwater J-box and trunk cable installation. A single junction box that connects the trunk cable to the array cables would be installed in about 80 ft of water.

- Cable Array Deployment. Array cables and nodes would be deployed in mid-water and deep depths starting at about 11 nm from shore up to about 42 nm from shore.

- Equipment Verification. During the offshore deployment of the arrays, the sensors would be tested to ensure the system is operational.

![Figure 2-1](image_url)

**Figure 2-1** Regional Overview of Project Location
2.2.2 Onshore Installation

The Proposed Action (Figures 2-2 and 2-3) includes a temporary onshore construction site (drill site) on the terrace, an onshore cable trench between the construction site and the BSURE cable vault (Figure 2-2), and an underwater construction site on the seabed in depths of 50-100 ft (15-30 m) (Figure 2-3). Both the onshore and offshore sites have been designed conservatively to accommodate the required installation activities. Onshore HDD activity would occur for five weeks; to pull ashore and connect the trunk cables would require another two days.

The temporary onshore construction site comprises 1.3 acre (0.5 ha) of land, providing space for the HDD rig and associated trenching equipment and storage area for drill pipe. Figures 2-2 and 2-3 illustrate the proposed working area. The location for the Proposed Action is consistent with the historical work site at PMRF. This location minimizes construction/infrastructure costs, potential conflicts with military training activities, and biological and cultural resource impacts.

Onshore activity would include routing the trunk cables from the HDD rig to the CTB (Building 410). The new trunk cables would be buried in a trench from the HDD bore entry to the BSURE vault. The trench would be approximately 2 ft (0.6 m) deep and 10 ft (3 m) wide and would be approximately 78 ft (24 m) long as depicted in Figure 2-2. The 10 ft accommodates the temporarily disturbed area of the excavating machinery. The actual excavated trench will be 2 ft (0.6 m) wide and back filled after the
cable installation. The trunk cables would be continuously routed through the SWTR vault and existing underground pipes to Building 410. The trunk cables would be terminated at the bore start locations T1 and T2 (Figure 2-2) and optically/electrically connected to existing terrestrial cable inside Building 410 which also contains the IWS power supplies. The existing terrestrial cables connect to the Range Operations Center at Building 105.

2.2.3 Horizontal Directional Drilling (HDD)

Two drill pipes of nominal 5-inch outer diameter would be installed via horizontal directional drilling (HDD) from the temporary onshore construction site to a location approximately 5,000 ft (1,500 m) offshore. The drill pipes would emerge at exit points on the seabed within an underwater construction site. Figure 2-4 illustrates the approximate HDD Cross Section from the shore to the exit points. A preliminary estimate is that the drill would be angled downward at the bore entry to a depth of roughly 125 ft (38 m), and continue horizontally seaward underground until nearing the bore exit point, where the drill would be shallowly angled upward to emerge on the seabed. The proposed underwater construction site is comprised mostly of non-living coral-limestone pavement with intermittent shallow sand cover, intermittent patches of live hard coral and narrow deeper sand channels. The underwater construction site has been delineated to capture a zone of appropriate location, bathymetry, and depth that meet the project requirements. The entire 16.8 ha (41.5 acres) would not be impacted; rather, small areas within the
underwater construction site boundary would be used for drill exit points and associated IWS hardware installation. Using HDD reduces the amount of disturbed land in the coastal zone compared to the historical method. The historical method of laying cable on the sea bed impacts the coastal zone from the shore to the J-box, while using HDD reduces the impact area to a small area around the exit points and the J-box.

The following is an explanation of the HDD methodology to be employed: The configuration of the drill rig, mud system, and support equipment will be done in such a way as to comply with existing and temporary rights-of-way (See Figure 2-2 and Table 2-1 for Onshore Construction Site). The work area will require some special preparations including a small pit approximately 3 x 2 x 1 meters filled with concrete. The concrete pad will be used as a dead man, anchoring the drill rig while drilling to ensure the stability of the equipment with the forces required during the drilling procedure. Figure 2-5 shows the layout of a typical HDD site, which would be located within the onshore construction site. A small sump pit will be excavated at the bore entry, this sump pit allows for the recovery of the drilling fluid coming from the borehole back to the surface. The fluid is picked up by a sump pump and transferred to the solids control unit where the solids contained in the drilling fluid are mechanically separated allowing the mud to be re-circulated down hole and used again. Most of the erosion control will be installed after all equipment is in place so any necessary movement during the set up process will not be impeded.
HDD water requirements on average are approximately 10,000 gallons (38,000 liters) per day. The water is mixed with bentonite clay to make slurry or “cutting” fluid. Bentonite clay (sodium bentonite) is a non-toxic, naturally occurring substance which would be purchased from a commercial source by the contractor, brought to Kauai, and stored at the construction site. County water is available on Kauai for the operation and would be provided on-site via a water supply located in the near vicinity of the construction site. Excess returns of the water/clay mixture and the excavated material would be trucked for disposal to the Kekaha Municipal Solid Waste Landfill (location shown on Figure 2-1). A rough estimate for the total mud disposal is 160 barrels (600 lbs of Bentonite). A rough estimate for the total solids disposal is 103 cubic yards (79 m³). The Kekaha Landfill receives an average of 88,000 tons per
year of solid waste (www.keepinghawaiiclean.com/kekaha.htm). Given that one cubic yard of mud weighs approximately one ton, the material that would be generated by the HDD operation is a relatively small fraction of the normal waste stream. The Kekaha Landfill has existing capacity for continuing operations to approximately January 2009, and current plans are to expand the capacity of the landfill by 1,550,000 cubic yards (County of Kauai 2007).

From the bore/hole entry to the mean low tide, a thin 8 gauge wire will be laid out along the perimeter of the shore-based portion of the drill trajectory. The wire will be used to create a locating grid. While drilling, the wire will be energized with a small DC magnetic field with known corner points that would be picked up by a sensor located in the underground steering tool. The grid would be used to verify the independent location reading transmitted to the control cab through a wire in the drill stem. The steering tool, located behind the drill bit, would keep track of the azimuth and inclination, giving the surveyor an accurate location of the bit at all times.

When the drilling rig is in place and applicable environmental measures (section 2.4 and 2.5), including best management practices (BMPs) for construction storm water and provisions of the Bentonite Spill Prevention and Monitoring Plan (NUWC 2007) have been implemented, drilling will begin. The non-magnetic bottom hole assembly with the steering probe inside is placed on the drill string and the jet assembly is installed on the lead end of this piece. The non-magnetic drill collar will serve as a buffer between the possibly magnetized drill string, jet assembly and the steering tool ensuring greater accuracy. The drill string is advanced along the pre-determined drill path while drilling fluid is pumped down the inside of the bore pipe and exits through the drill head. The fluid then returns to the entry pit through the annulus between the outside of the drill pipe and the formation being bored. The drilling fluid is composed of naturally occurring Bentonite clay and water. The clay is insoluble and made up of small particles that function as a lubricant for the drill head and pipe, a transport for the cuttings being removed from the hole, and as a sealant that fills the annulus space surrounding the drill hole. During the drill, as each joint of pipe is set onto the drill rig, a visual inspection is done to make sure no debris is sent down the pipe that could cause a problem during cable installation. Directional information is accumulated while drilling and survey shots are taken on every joint of drill pipe. This data is calculated and plotted on a work plan and profile drawing so the true vertical depth and horizontal distance as well as right and left bearing drift are always known throughout the entire drilling operation.

As the drill stem approaches the exit point on the ocean floor, the drilling conditions are carefully monitored. These conditions determine the time or distance from exit when a shift from the Bentonite to fresh water drilling is done. By flushing the drill string with fresh water, the drilling mud is circulated out of the system and a mud free exit is achieved. Drilling conditions, not a pre-determined distance will be the factor as to what point the change to water will occur. As a rule of thumb, 46 meters prior to planned exit of the drill from the sea floor is the average distance at which a change to fresh water happens. The driller and surveyor will know when the bottom hole assembly exits the sea floor, not by a loss in pressure, but by watching the console inside the drill cab. When the bottom hole assembly is no longer supported by the formation, the angle of inclination will fall off dramatically thus signaling the bore exit. Commercial divers will be dispatched to dive on the exit and verify the exit point. Figure 2-6 illustrates the HDD bore exit point environment.
Once the exit has been approved, divers will jet down below the sea floor, and using underwater cutting equipment will cut off the drill steel at the desired depth. The excess pipe and drill bit will be hoisted to the boat with lift bags and returned to the onshore construction site. Once the pipe is cut and the end of the pipe has been de-burred to remove any sharp edges, the guidance wire will be removed and a pipe pig will be installed at entry with a cable attached. This will be hydraulically pushed through the drill pipe with fresh water and the cable trails the pig. This proofs the pipe as well as verifies a clean inside diameter. A flapper valve and surface buoy will be attached to seal the drill steel for future location.

Both drilled bores would exit the sea floor in the underwater construction site. The underwater construction site represents a planning area in which conditions are suitable for the proposed project, based on water depth and distance from shore. Only a very small portion of this area is needed for the junction box and cables and would be subject to installation activities and/or structures. The site encompasses the work areas needed for installation of the J-box, placement of surface-laid split pipe (5-inch [12.5 cm] outer diameter) from the drill exit to the J-box, the drill exits, and 4 surface-laid cables to the deep edge of the site. The actual area of surface disturbance on the seabed is estimated to be 3,234 ft² or 0.08 acre (0.03 ha). Table 2-2 identifies the underwater site boundaries. Figure 2-7 illustrates the approximate path of each drill. Figure 2-8 illustrates a detailed map of each HDD exit point and the associated tolerance or accuracy of the exit point. The accuracy of the HDD exit point has been estimated at ± 200 ft (60 m) by the drillers.
Table 2-2  Underwater Construction Site Coordinates

<table>
<thead>
<tr>
<th>Latitude</th>
<th>Longitude</th>
<th>~ Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 3 18.75 N</td>
<td>159 47 57.33 W</td>
<td>31-m</td>
</tr>
<tr>
<td>22 3 25.93 N</td>
<td>159 47 54.08 W</td>
<td>30-m</td>
</tr>
<tr>
<td>22 3 17.01 N</td>
<td>159 47 31.35 W</td>
<td>13-m</td>
</tr>
<tr>
<td>22 3 9.83 N</td>
<td>159 47 34.59 W</td>
<td>16-m</td>
</tr>
</tbody>
</table>

Figure 2-7  HDD Planning Full Extent
At the conclusion of HDD, all loose hardware will be removed from offshore work areas. All onshore excavations will be backfilled, and native vegetation will be mixed with the backfill to promote rapid return to the pre-work condition. All work materials will be removed from the job site. All excess drilling fluid will be removed from the collection pit and disposed of at the municipal landfill. The cumulative amount of time on-site is expected to be approximately six weeks. **Table 2-3** identifies the planned as-built salient coordinates.

**Table 2-3** HDD Salient Coordinates

<table>
<thead>
<tr>
<th>Point</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Depth (meters)</th>
<th>Horizontal Distance from HDD start to HDD exit (meters)</th>
<th>Shore trench distance from BSURE Vault to HDD start (meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>J-box</td>
<td>22 3 16.90 N</td>
<td>159 47 49.46 W</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HDD-1 (Exit Point Bore 1)</td>
<td>22 3 16.85 N</td>
<td>159 47 47.07 W</td>
<td>22</td>
<td>1580</td>
<td></td>
</tr>
<tr>
<td>HDD-2 (Exit Point Bore 2)</td>
<td>22 3 20.45 N</td>
<td>159 47 45.44 W</td>
<td>22</td>
<td>1600</td>
<td>0</td>
</tr>
<tr>
<td>T1 (Start Point Bore 1)</td>
<td>22 2 50.79 N</td>
<td>159 46 58.64 W</td>
<td>22</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>T2 (Start Point Bore 2)/HDD Input</td>
<td>22 2 51.40 N</td>
<td>159 46 59.22 W</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.2.4 Underwater J-Box and Trunk Cable Installation

The underwater J-box will connect the trunk cable to the arrays. The trunk cable is defined as the segment from the in-water J-box to a dry termination in close proximity to the Cable Termination Building (CTB). Both trunk cables will be contained within directional drilled pipes. The trunk cable that connects to the J-box would be protected with 5-inch (12.5 cm) outer-diameter split pipe between the bore exit and the J-box (see below). The second trunk cable would be loosely coiled (10-20 ft (3-6 m) diameter) without split pipe and secured to the seabed at the second bore exit for future availability. On the land side, terrestrial cable would connect the trunk cable from an external cable vault/termination box to an indoor termination/distribution box within the CTB.

The J-box and trunk cables would be deployed prior to the sensor array cable deployment. The J-box is terminated to the trunk cable on board the ship. The box with the attached trunk cable is lowered into the water by a winch/A-frame combination. Divers will assist in the placement as much as possible. They may also disconnect the box lowering line. Split pipe will be applied by the divers to the section of cable that lies between the J-box and the HDD drill exit. Divers would secure the second trunk cable to the seabed at the second bore exit. The J-box is an open, rectangular, metal-frame, bottom-mounted structure made of welded steel, which houses the connections between the trunk cable and the arrays. It would contain pressure housings to enclose the transition between the trunk cable and the internode cables. The J-box would contain pre-terminated (and sealed to prevent water intrusion) internode cable pigtails or branching units. These pigtails, which connect the junction box to the beginning of an array cable, would be coiled in the box and individually raised to the surface for connecting to an individual array. The trunk cables would both be pulled through the HDD bores to shore, followed by the lowering of the J-box to the seafloor. J-box installation would take approximately one day.

The underwater construction site is in an area where sand accumulates in low areas of flat, pitted, fossilized limestone substrates. The site contains sparsely distributed coral on surrounding natural substrate such as rock outcrops (Dollar and Brock 2006). Additionally, coral frequently occurs on cables and manmade structures on the waters of PMRF. The preferred J-box location within the underwater construction site was determined during a May 2007 engineering dive survey. Figure 2-9 shows the preferred location. The preferred J-box location was identified as a sandy bottom, with a sand depth of 12-18 inches (0.3-0.45 meters) above and bordered by limestone substrate with small patches of coral. During the survey, divers laid out a representative J-box working area (approximate area of temporary disturbance) that measured 35 ft by 32 ft (10.7 X 9.7 meters). The J-box itself will measure 12 ft by 15 ft (approximate area of permanent disturbance). The J-box would be slowly lowered by a winch from the installation vessel with divers, per safe diving practices, guiding the structure into the planned location.

All system components, including cables and J-box, deployed beyond the drill pipe exit would be secured to the sea floor using conventional stabilization methods and the experience gained with previous PMRF cable stabilization efforts. Stabilization protects not only the equipment but the surrounding environment by eliminating current-induced movement of the cables, which could otherwise cause the abrasion of both the cables and the substrate. To stabilize the J-box and trunk cable, split pipe will be applied surrounding the cables between the J-box and drill exit points (labeled HDD1 in Table 2-3). Threaded rods will then be installed by jetting and clearing the 12 to 18-inch sand depth. Using handheld hydraulic drills, the divers will drill 0.75-inch diameter holes in the sea floor and the threaded rods will be installed in the drilled holes and filled with an underwater epoxy grout. The grout is a rapidly hardening resin/
compound that is much denser than water and immediately sticks to the substrate upon application by a diver using a handheld “gun.” The material does not disperse into the surrounding water, and is non-toxic in any case. After checking to verify the pull-out strength of the rods, steel clamps are secured to the threaded rods which reduce the movement of the pipes and cables.

Beyond the J-box (towards sea) divers will install threaded rods and steel clamps in the hard bottom substrate about every 200 ft out to approximately 100 ft in depth to stabilize cable to the seafloor.

### 2.2.5 Cable Array Deployment

Cable array deployment would require two days for each of the four arrays (eight days total). Of the 41 nodes to be deployed, 39 of them would be deployed in the open ocean more than 12 nm from land. It is estimated that 188 nm (339 km) of internode cable would be needed to fulfill the requirements for the arrays. Internode cable is defined as the cable sections from the J-box to the first node and all subsequent sections between nodes. The design of the internode cable would be similar to standard submarine telecommunication cables. The cable would be over-armored for protection from the J-box to a depth of about 1500 ft. Over-armor is a sheath of one or more additional layers of steel wires wrapped around the cable. The cable diameter decreases from 1.70 inches at the J-box to less than 1 inch in deep water. The BSURE refurbishment would consist of four arrays, identified (for the purpose of this document) by letters I through L proceeding east to west, with the number of in-line nodes varying from 10 to 11 per array. The node locations and estimated cable routes are illustrated in Figure 2-10. The depth of the array, number and type of nodes, and lengths of cable required per array are summarized in Table 2-4.
Most of the nodes would be uni-directional (receive-only, labeled Uni in Figure 2-10). Each array would include both high- and low-frequency bi-directional nodes (labeled BiDi-Hi and BiDi-Lo in Figure 2-10). The operational boundaries of BSURE would remain unchanged.

The deployment of the cables would utilize conventional cable laying machinery including a linear cable engine (LCE) and cable pans. The machinery provides a gradual, controlled rate of descent to minimize the risk of damage to the equipment as it lands on the seabed. The cable routes have been initially determined by a desktop survey, including a review of historical bathymetric data and previous cable deployments. The intent of the desktop survey is to avoid gross areas with abnormal bottom anomalies. If required, additional geophysical surveys (e.g. bathymetric survey in deep water) may be performed. Currently, low resolution bathymetric data exists for the subject areas.

Each array cable would be double-armored (two layers of steel wires) for protection, from the J-box to a depth of 328 ft (100 m). The new BSURE cables will follow the existing cable routes as much as practically possible. The cables routes were selected to avoid steep bathymetry; the spreading out or turning of cables is planned to occur at a constant depth, thus avoiding placing any cables at angles to the downward slope. The installation of cables parallel to the steep slope of the seabed offshore Kauai is also avoided. It is expected that the new cables would lie across existing cables as they are deployed. This is not a concern because the undersea cables for the original BSURE sensors would continue to be used to allow continuous range operations during installation and verification activities and would provide a backup capability as long as the cables are operational.
Figure 2-10  Proposed Sensor Layout
Table 2-4 Proposed Array Configuration

<table>
<thead>
<tr>
<th>Array #</th>
<th>Water Depth (m)</th>
<th># Uni-Directional Nodes</th>
<th># Bi-Directional Nodes</th>
<th>Cumulative # Nodes</th>
<th>Estimated Total Cable Length (km)</th>
<th>Cumulative Internode Cable Length (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>2100-4500</td>
<td>7</td>
<td>3</td>
<td>10</td>
<td>85.46</td>
<td>85.46</td>
</tr>
<tr>
<td>J</td>
<td>2100-4500</td>
<td>7</td>
<td>3</td>
<td>20</td>
<td>83.08</td>
<td>168.53</td>
</tr>
<tr>
<td>K</td>
<td>1500-4500</td>
<td>8</td>
<td>3</td>
<td>31</td>
<td>86.68</td>
<td>255.21</td>
</tr>
<tr>
<td>L</td>
<td>1200-4500</td>
<td>7</td>
<td>3</td>
<td>41</td>
<td>84.05</td>
<td>339.26</td>
</tr>
</tbody>
</table>

2.2.6 Equipment Verification

During the offshore deployment of the arrays, the bi-directional and uni-directional nodes would be tested to ensure that the sensors are functional. After the installation is complete, a positional survey would be performed to geodetically locate the sensors on the range. The verification equipment used for the deployment verification and for the survey would use existing PMRF resources that are routinely used during normal range maintenance activities. The equipment includes an in-water transducer and shipboard support electronics including a synchronized ping generator, global positioning system receivers and antennas, thermal strip recorder, amplifier, and computer speaker. The acoustic properties of these range sources have been evaluated by the Navy and National Oceanic and Atmospheric Administration (NOAA). “Based on the operational characteristics (source output level and/or frequency) of these acoustic sources, the potential to affect marine mammals is unlikely” (NOAA 2006).

The communications capability of the bi-directional node would be verified during and after deployment by having the bi-directional sensor transmit an acoustic signal to the installation vessel at the surface. This verification test simulates the normal voice communication conducted during typical range activities. The functionality of the uni-directional nodes would be verified by deploying a transducer from the installation vessel. The transducer would emit short acoustic signals that would be received and detected by the node sensors. This verification test simulates the undersea tracking that occurs during typical range maintenance activities. These tests would occur intermittently during each array deployment; one array deployment is estimated at 2-days. Approximately 90% of the equipment verification would take place in the open ocean beyond the 12-nm limit of the territorial seas.

The post deployment positional survey is conducted to locate the precise seafloor position of each deployed node. The survey would be conducted using a commercial motor vessel outfitted with a transducer. As the vessel transits the range in a grid pattern, the transducer would emit short acoustic signals. These signals would be received and detected by the new sensors. The information contained in the signal detections is used to calculate sensor locations on the ocean floor. The surveying process requires the equivalent of 14 continuous days. Approximately 90% of the positional survey would take place in the open ocean beyond the 12-nm limit of the territorial seas. As stated previously, these are routinely used range acoustic sources, the use of which has been previously evaluated and found unlikely to affect marine mammals (U.S. Navy 1998, Mobley 2000, Jette et al. 2005, U.S. Navy 2006, NOAA 2006).
2.2.7 Equipment and Chronology

Table 2-5 lists the types of equipment involved in each activity. Table 2-6 provides a chronology of the installation activities. Activities are shown consecutively for convenience; some overlap or delay between activities may occur. Contingencies for in-water activities include up to 8 additional days for delays due to weather or unplanned circumstances. Installation activities are planned to occur in spring through summer months when seas are relatively calm offshore Kauai. Installation would begin no earlier than July 2009.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-wheeler/trailer truck</td>
<td>Equipment transport, mainland and Pearl Harbor</td>
</tr>
<tr>
<td>Drill rig/300 kW generator</td>
<td>HDD onshore</td>
</tr>
<tr>
<td>Generator 25 kW</td>
<td>HDD onshore</td>
</tr>
<tr>
<td>Mud mixer and reclaimer</td>
<td>HDD onshore</td>
</tr>
<tr>
<td>Backhoe/loader</td>
<td>Mobilization/demobilization, HDD and onshore cable installation</td>
</tr>
<tr>
<td>Bulldozer</td>
<td>Onshore trunk cable installation</td>
</tr>
<tr>
<td>Boom truck (12-ton)</td>
<td>HDD onshore</td>
</tr>
</tbody>
</table>
Table 2-6   Chronology of Activities Associated with the Proposed Action

<table>
<thead>
<tr>
<th>Activity</th>
<th>Duration (days)</th>
<th>Day</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HDD Operation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobilize HDD equipment and dive support equipment and vessels, transit to Kauai</td>
<td>15</td>
<td>1-15</td>
</tr>
<tr>
<td>Mobilize drill rig site</td>
<td>7</td>
<td>16-22</td>
</tr>
<tr>
<td>HDD operations, 2 bores</td>
<td>20</td>
<td>23-42</td>
</tr>
<tr>
<td>Demobilize drill rig site</td>
<td>8</td>
<td>43-50</td>
</tr>
<tr>
<td>Return HDD equipment to origin</td>
<td>15</td>
<td>51-65</td>
</tr>
<tr>
<td><strong>Junction Box (J-box) Trunk Cable and Array Installation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Note: The trunk cable install is not required to immediately follow the HDD Operation. There may be a period of day or weeks separating the two events.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobilize Vessel in Port Hueneme, California</td>
<td>5</td>
<td>1-5</td>
</tr>
<tr>
<td>Transit vessel to Honolulu</td>
<td>7</td>
<td>6-12</td>
</tr>
<tr>
<td>Final Vessel Mobilization in Honolulu</td>
<td>2</td>
<td>13-14</td>
</tr>
<tr>
<td>Transit to Kauai and prep for installation</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>Install first trunk cable and j-box, minimum stabilization</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Install second trunk cable</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>Connect and deploy String I</td>
<td>2</td>
<td>18-19</td>
</tr>
<tr>
<td>Return to Honolulu, load and test array J, transit to Kauai</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Connect and deploy String J</td>
<td>2</td>
<td>21-22</td>
</tr>
<tr>
<td>Return to Honolulu, load and test array K, transit to Kauai</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td>Connect and deploy String K</td>
<td>2</td>
<td>24-25</td>
</tr>
<tr>
<td>Return to Honolulu, load and test array L, transit to Kauai</td>
<td>1</td>
<td>26</td>
</tr>
<tr>
<td>Connect and deploy String L</td>
<td>2</td>
<td>27-28</td>
</tr>
<tr>
<td>Complete in water stabilization/Demob/Transit to Honolulu</td>
<td>3</td>
<td>29-31</td>
</tr>
<tr>
<td>Weather/Contingency Days</td>
<td>8</td>
<td>32-39</td>
</tr>
<tr>
<td>Demobilize OSS installation vessel in Honolulu</td>
<td>2</td>
<td>40-41</td>
</tr>
<tr>
<td>Transit vessel to Port Hueneme</td>
<td>12</td>
<td>42-53</td>
</tr>
<tr>
<td>Demobilize vessel in Port Hueneme</td>
<td>5</td>
<td>54-58</td>
</tr>
<tr>
<td>Mobilize survey vessel in Honolulu</td>
<td>2</td>
<td>59-60</td>
</tr>
<tr>
<td>Perform acoustic survey</td>
<td>14</td>
<td>61-74</td>
</tr>
<tr>
<td>Demobilize vessel in Honolulu</td>
<td>2</td>
<td>75-76</td>
</tr>
</tbody>
</table>

2.3 **No Action Alternative**

Under the No Action Alternative, BSURE refurbishment would not occur. No array installation would be conducted. Continued age-related random failures and accidental damage to the 27 year old BSURE in-water hardware would continue to occur. Range tracking and communications capabilities would degrade or be completely stopped. The No Action Alternative would lead to an increasingly likely event of sudden, complete failure. If this occurred, Mid-Pacific Fleet Submarine Training would be severely curtailed. Training operations would be forced to move to the nearby 120 sq mile BARSTUR range. The small size of BARSTUR limits exercise scenarios and training realism. The scheduling of operations on the one remaining range would be much more difficult as Mid-Pacific fleet ships, aircraft, and submarines would be forced to compete for training time.
Repairs to the existing BSURE components are extremely problematic due to the lack of spares and the fact that the 27 year old electronics equipment and cable is no longer manufactured nor readily available. It is very likely that spot repairs done on an as-needed basis using 1970's technology would take longer and be much more expensive than the complete replacement that the preferred alternative proposes. As-needed repairs to a 27 yr-old-plus system would also be needed more frequently than on a new system. Multiple repairs could potentially lead to more cumulative environmental effects versus a one-time replacement.

2.4 SPECIAL CONSERVATION MEASURES

The following measures would be implemented to reduce potential environmental effects of the refurbishment activities:

1. NUWC and PMRF will maintain oversight of all contractor activities on Kauai and in the offshore waters throughout the installation, including activities in the open ocean beyond 12 nm from shore. PMRF will conduct a safety and environmental briefing for all contractor personnel prior to installation activities. The briefing will explain existing policies regarding the sensitive biological and cultural resources at and offshore of PMRF and illustrate the need to minimize disturbance to cultural sites and native plants, wildlife, and marine habitats. Natural and cultural resource protection shall adhere to the policies and procedures set forth in the PMRF EIS, Integrated Natural Resources Management Plan (INRMP), and Integrated Cultural Resources Management Plan (ICRMP) (U.S. Navy 1998, 2001, 2005a). If any archaeological deposits are inadvertently discovered during the course of the Proposed Action, the standard operating procedures of the ICRMP would be followed.

2. For the onshore installation activities at PMRF, the contractor will be familiar with and would implement PMRF’s Spill Prevention Control and Countermeasure’s Plan and Installation Contingency Plan in the unlikely event of a spill of petroleum-based fuel or lubricant. The contractor will also be familiar with and implement as necessary PMRF’s Hazardous Waste Management Plan, which identifies requirements for safe storage and segregation of hazardous material, proper safety equipment, spill or accident reporting procedures, and personnel training.

3. For the onshore installation activities at PMRF, applicable environmental and energy conservation Federal Acquisition Regulations (FAR) clauses have been incorporated in the installation contract by reference, and the following are included in full text (e.g. D25 Hazardous materials; I23-3 (FAR 52.223-3 Hazardous Material Identification and Material Safety Data) ; and, I23-7001 (DFARS 252.223-7001 Hazard Warning Labels). The FAR clauses are incorporated into all onshore construction activities to be proactive with energy conservation measures and to limit the generation and offsite transport of pollutants. Construction equipment shall be well-maintained and free of leaks. Mobile equipment will refuel only at the established fueling station on Kauai. Stationary equipment will be positioned on level ground or bermmed to prevent runoff from the equipment area to the ocean. Parking for vehicles and equipment will be limited to existing parking areas, roads, and designated construction areas at PMRF.

4. Any nighttime lighting associated with the onshore drilling site will be shielded downward to avoid attracting or causing the disorientation of wildlife.

5. During HDD activities onshore and in the nearshore waters surrounding the drill exits, the installation contractor will implement the BSURE bentonite spill prevention, monitoring, and cleanup measures specified in the Navy’s plan (NUWC 2007).
6. For all in-water installation activity, PMRF will issue a Notice to Mariners alerting boaters to the need to avoid areas of installation activity.

7. For all in-water installation activity, vessels engaged in installation would carry sorbent booms (floating barriers to contain and absorb oil on the surface of the water) and pads for cleanup use in the unlikely event of a fuel spill, and would adhere to all Navy (OPNAVINST 5090.1C, 22-9) and Coast Guard (Clean Water Act, section 311) requirements regarding the containment, cleanup, and reporting of spills.

8. The directionally drilled conduit to be installed by HDD will be made of clean, uncoated pipe. During the final phase of drilling, drilling fluids will be switched from a mixture of clay and fresh water to water only so that when the drill head exits the seafloor, there will be little or no release of clay or sediment.

9. Directional drilling precludes any ground disturbance in the sensitive dune area and eliminates the need for future cable maintenance in the surf-zone.

10. During diver-assisted work within the underwater construction site (depths to 100 ft [30 m]), the support vessels will not anchor on live coral, and divers will assist anchor placement as necessary to ensure coral avoidance. The larger cable-laying vessel would be dynamically positioned and would not anchor.

2.5 Other Regulatory Compliance Actions

1. Since the onshore construction site is larger than one acre, the project would obtain coverage for storm water discharge under the State’s National Pollutant Discharge Elimination System (NPDES) General Permit Authorizing Discharges of Storm Water Associated with Construction Activities. A Notice of Intent, including a construction plan incorporating best management practices (BMPs) to control runoff, pollutants, and erosion/sedimentation, will be prepared and submitted to the State of Hawaii Department of Health, Clean Water Branch at least 30 days prior to construction activities.

2. As required under Section 10 of the Rivers and Harbors Act, a permit will be obtained from the U.S. Army Corps of Engineers (USACE) for the installation of structures on the seabed within 3 nm of shore. Discharge of dredged or fill material that would require a Section 404 (Clean Water Act) permit is not anticipated, based on recent similar projects in Hawaii (USACE 2006). The Section 10 permit would be applied for after the Navy completes its NEPA/EO 12114 environmental review of the proposed action.
CHAPTER 3
AFFECTED ENVIRONMENT

3.1 AREA SUBJECT TO NEPA: PMRF ONSHORE AND OFFSHORE (≤12NM)

3.1.1 Geology and Soils

Geology and soils include the landforms, soils/sediment, substrate, topography, and seismicity of a given area.

Kauai is the geologically oldest of the eight main Hawaiian Islands, formed by a massive shield volcano. The hot spot volcano created the chain of islands as the Pacific Plate drifted northwest. The Hawaiian Islands developed in the middle of the Pacific Plate, with no tectonic boundary. Therefore, the Islands have no true continental shelf and only a narrow band of sloping coastal bathymetry surrounding the emergent land mass (U.S. Navy 2005b).

The onshore construction site is located on the low-lying coastal terrace of the Mana Plain, which consists of alluvium, lagoon, beach and dune deposits overlying volcanic bedrock (U.S. Navy 1998, 2001). The onshore construction site is a flat, previously disturbed area of PMRF, approximately 200 ft (60 m) inland from the beach, behind a shore berm, and not within a watershed or drainage area. The substrate of the onshore construction site is naturally occurring, deep calcareous beach sand over a prehistoric limestone platform that formed when sea level was higher. The site is fronted by a berm and is at approximately 15 ft MSL elevation, is well above the level of the highest tides and has not been subject to flooding in recent history, including Hurricane Iniki in 1992 (personal observations of Mike Dick, PMRF).

In shallow depths (less than 50 ft [15 m]) between the onshore and offshore construction sites, the substrate is an eroded fossil limestone reef or pavement. Low, flat areas tend to be covered with an unstable veneer of sand, whereas areas of higher relief support a higher cover of algal turf, coral, and other colonial invertebrates (U.S. Navy 2001). The offshore construction site is in an area of flat to pitted and occasionally potholed limestone with sand channels, with a break in the limestone shelf at about 65-82 ft (20-25 m) depth, with occasional steep faces dropping away into sand at about 82-98 ft (25-30 m) (Dollar and Brock 2000; U.S. Navy 2001). Seaward from the proposed J-box location, the limestone pavement gives way to basalt-lava outcrops and carbonate sands (U.S. Navy 1997; PMRF 1995-1996).

The bathymetry surrounding the Hawaiian Islands becomes quite steep at depths of approximately 1,300 ft (400 m), dropping into a relatively flat abyssal plain that extends from depths of approximately 10,000 to 16,600 ft (3,000-5,000 m) (U.S. Navy 2005b). The BSURE tracking arrays are located offshore in 6,000 to 15,000 ft (1,800-4,500 m) depths, outside of the coastal margin of Kauai, extending across the lower edge of the insular slope as it flattens into the upper part of the abyssal plain (Figure 1-1: U.S. Navy 2005b). The insular slopes of the Hawaiian Islands are composed of basalt substrate with exposed rocky features. The insular slope ends as the bathymetry plunges to the abyssal plain near the 12 nm limit.

3.1.2 Water Quality

This section describes surface water and water quality in the onshore and offshore areas within 12 nm. There are no surface waters on the onshore project site, which consists of well-drained beach sand. Shallow brackish groundwater exists where percolating freshwater reaches the seawater table. According
to the Kauai County Flood Insurance Rate Map, the area is within the coastal flood zone, subject to 1% annual chance of flooding by waves.

Waters of the Hawaiian Islands are located in the southern path of the North Pacific Subtropical Gyre, a large-scale current pattern that moves water in a clockwise direction around the North Pacific. Surface waters of the North Pacific Tropical Gyre are light-saturated and nutrient limited. Subsurface waters are rich in nutrient content, while light is limited. Surface waters are warm 75 to 82 °F (24 to 28 °C) and productive in areas of upwelling, where nutrient-rich waters become exposed to sunlight (U.S. Navy 2005b). The depth of the thermocline varies with seasons; stratification of the water column in strongest in the summer, when the thermocline may rise to a depth of 100 ft (30 m).

The major surface current is the Northwest Hawaiian Ridge Current, which flows toward the northwest past Kauai and Niihau, with surface velocities of 10-25 cm/sec. However, local eddy circulation dominates nearshore, with velocities of up to 100 cm/sec. Normal surface conditions of the BSURE range are typical for the mid-Pacific with swell periods of seven to ten seconds and wave heights of 2-4 ft. The mixing of the ocean swells from the east along the south shore of Kauai and from the north along the Na Pali, or western coast of Kauai, produce 3 to 5 second erratic swell periods and variable currents in the range. In addition, trade winds from the northeast create a diagonal wind shear through the southern part of the range with calmer waters to the south. The only freshwater runoff is from the Nohili Ditch, several hundred feet north of the site. This does not appreciably reduce salinity from that of normal seawater. The State Department of Health (DOH) classifies the waters adjacent to Barking Sands bounded by the 100-fathom (183-meter) contour as Class A. As such, they are designated as protected for primarily recreational use and aesthetic enjoyment. Class A waters may be used for other purposes that comply with the protection and propagation of fish, shellfish, and wildlife, and with marine recreation. Water quality off Barking Sands is excellent. No Clean Water Act section 303(d) Impaired Waters as listed by the DOH are in the vicinity (http://www.hawaii.gov/health/environmental/env-planning/wqm/wqm.html).

Runoff and effluent from land is discharged into the neritic zone near the shoreline. The coastal current system surrounding the Hawaiian Islands has a strong flow and exchange with offshore waters (U.S. Navy 2005b), diluting and dispersing sediment and pollutants. Water quality near BSURE within 12 nm of the shore is presumed to be excellent.

3.1.3 Biological Resources

Biological resources include onshore and offshore habitats, fish and wildlife, special-status species (threatened and endangered species, sea turtles and marine mammals), and essential fish habitat (EFH). Marine biological resources, such as aquatic vegetation, marine wildlife, threatened and endangered species, sea turtles, and marine mammals are discussed in relation to the onshore and offshore project area within 12 nm of shore, including the benthos and pelagic waters.

Onshore Habitat

The onshore construction site consists of a flat, sandy, previously disturbed area supporting ruderal vegetation, fronted by patches of low dune (Naupaka) vegetation (Figure 3-1).
Ruderal vegetation at Barking Sands occupies disturbed soils. Plant species include buffelgrass (*Cenchrus ciliaris*) and Bermuda grass (*Cynodon dactylon*), and weedy annuals such as Spanish needle (*Bidens pilosa*) and lovegrass (*Eragrostis amabilis*). The Naupaka community is a dune plant assemblage including low mats of woody pohinahina (*Vitex rotundafolia*) and thickets of naupaka (*Scaevola sericea*) (U.S. Navy 1998, 2001). Areas surrounding the onshore construction site (Figure 3-2) support Koawe-Koa-Haole Scrub vegetation (see section 4.6.2.1 of the INRMP [U.S. Navy 2001] for descriptions).

**Offshore Habitat**

In waters of the Hawaiian Islands, topographic variability is more prevalent near the Islands than far offshore. High relief substrate provides habitat for many fish and invertebrates. Corals and coarse fragments extend to distances near the 12-nm limit, where bathymetry plunges to the abyssal plain and substrates are unconsolidated with less relief (U.S. Navy 2001). **Figure 3-2** illustrates the nearshore marine habitats of the project area.
Figure 3-2  BSURE Construction Areas and Habitat Types
(sources: NOAA (National Ocean Service) 2003; University of Hawaii 2006)
Coral reefs occur off of Barking Sands in a narrow fringing reef from Mana Point to Nohili Point (Figure 3-2) (U.S. Navy 2005b). Off of Nohili Point, the nearshore environment (to approximately 50 ft [15 m] deep) is comprised of an old fossil reef platform. The reef structure, predominantly formed of fossilized finger coral (Porites compressa), is fragmented and broken, resulting in complex and high-relief substrate. *Porites compressa* typically requires calm waters for long periods of time to grow to substantial reef size. Currently, the west coast of Kauai experiences rougher water conditions than what is tolerated for extensive growth of *Porites compressa*. This implies that the finger coral reef formed during a time period in which the oceanographic conditions at Kauai were quite different than at present (U.S. Navy 2005a). Currently, small colonies of live coral are distributed over the fossilized reef blocks. Coral cover in shallow water off Nohili Point is 32 to 39 percent, dominated by *Porites lobata*, *Pocillopora meandrina*, and *Montipora patula*. Southward from Nohili Point, in the shallow water habitat between the onshore and offshore construction sites, (inshore of the drill exit points and any installation activity), the limestone platform is flatter and living corals occur predominantly as flat encrustations, averaging 16 to 20 percent cover (Dollar and Brock 2000, 2006; Appendix C to the INRMP [U.S. Navy 2001]).

In the area of the offshore construction site, further offshore in depths of 50 to 100 ft (15-30 m), the substrate is a flat limestone surface with scattered potholes and small craters that range from 1 to 5 m in diameter. These potholes are not a common feature, as they are spaced from 20 to 80 m apart. At depths from 65 to 82 ft (20-25 m), the limestone shelf breaks and drops away into sand at 82 to 98 ft (25-30 m) of water (Dollar and Brock 2000, 2006). This shelf break ranges from a vertical face to a 20 degree slope. Overall coral is found at very low densities in this region. The most common coral species in this area is *Pocillopora eydouxi*, a small (to 3 ft [1 m]) branching colony which occurs at low density on the pitted surface. Other smaller corals are also present, and the total cover of live coral is approximately 5 percent (Dollar and Brock 2000, 2006; U.S. Navy 2005a). The general lack of cover and shelter sites in this area limits fish and macroinvertebrate diversity compared to the shallower areas (Dollar and Brock 2000, 2006; Appendix C to the INRMP [U.S. Navy 2001]).

Benthic habitat on the insular slope includes patches of hard substrate consisting of exposed volcanic bedrock and large rubble fragments would provide additional areas for the attachment and sheltering of benthic fauna (U.S. Navy 2005b). Some offshore (deep-sea) corals are present in territorial waters around Kauai and the other Hawaiian Islands (U.S. Navy 2005b).

Pelagic habitats, i.e., habitats of the open ocean above the seafloor, can be divided into a euphotic zone and an aphotic zone. The euphotic zone includes surface waters that receive ample sunlight to support photosynthesis. In Hawaiian waters, the euphotic zone extends to depths of 328 to 656 ft (100 to 200 m). The euphotic portions of the pelagic zone provide a nursery habitat for the larval and juvenile stages of many species of fishes and invertebrates that migrate into shallower waters and/or benthic habitats as adults.

Marine mammals, fishes, sea turtles, crustaceans, and other invertebrates forage in the pelagic zone. Plankton drift throughout the pelagic zone and provide the basic energy source for larger fauna. In addition to great numbers of schooling fishes that feed on the plankton, the pelagic zone includes many larger, predatory species that constitute important fisheries, among them squids, sharks, tuna, albacore, marlin, and swordfish. Fish and invertebrates of the pelagic zone provide food resources for wide-ranging seabirds that include petrels, shearwaters, albatrosses, gulls, terns, and noddies (U.S. Navy
For general information on seabirds that may occur in the vicinity of BSURE, see also http://www.botany.hawaii.edu/gradstud/eijzenga/seabirdshawaii/index.htm.

**Special-Status Species**

This section addresses species that are listed as threatened or endangered under the federal Endangered Species Act (ESA), as well non-ESA listed marine mammals that are protected under the Marine Mammal Protection Act (MMPA). Special-Status terrestrial species include a number of ESA-listed plant and wildlife species, whereas special status marine species include ESA-listed seabirds, marine mammals, and sea turtles, all of which are ESA-listed as threatened or endangered.

**ESA-Listed Plant Species**

Two federally listed endangered plant species may occur in the greater vicinity of Barking Sands, but the species do not occur in the area of the onshore construction site (section 4.6.2.2 of the INRMP [U.S. Navy 2001]). The lau ehu (*Panicum niihauense*) is a bunch grass species that has been documented in sand dunes and coastal scrub at Polihale State Park, north of the project area. The ohai (*Sesbania tomentosa*) is a low shrub to small tree. Ohai grows on sandy beaches, dunes, and scrub habitat. This species is also a known occupant of Polihale State Park. Critical habitat units for *Panicum niihauense* and *Sesbania tomentosa* are designated at several locations on Kauai. The proposed project site is not within the designated critical habitat units. The nearest critical habitat locations are Unit 14 (*Panicum niihauense* and *Sesbania tomentosa*) north of the project site near Nohili Point, and Unit 15 (*Panicum niihauense*) south of the project site at Mana Point (USFWS 2003; Figure 3-2).

**ESA-Listed Wildlife**

Four federally protected waterbirds occur in ditches and wetlands around Barking Sands PMRF. The Hawaiian coot (*Fulica alai*), common moorhen (*Gallinula chloropus*), black-necked stilt (*Himantopus mexicanus knudseni*), and Hawaiian duck (*Anas wyvilliana*) are all listed as endangered species. No critical habitat has been designated. Potential habitat for these species exists in the Nohili Ditch (Figure 3-2), but they are not known or likely to occur in the area of the onshore construction site.

The endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) has been sighted around the sewage treatment ponds (south of the project area) and in Recreation Area #1 near Makaha Ridge (north of the project area [Figure 2-1]) (Sections 4.6.3.2 and 4.7.2.2 of the INRMP [U.S. Navy 2001]). The habitat preferences for Hawaiian hoary bats are not well known, but the species roosts in native and non-native trees and along forest fringes (USFWS 1998). This species may forage or roost in the forested areas adjacent to Makaha Ridge.

**ESA-Listed Seabirds**

The Newell’s shearwater (*Puffinus newelli*) is a federally listed threatened species that occurs on the island of Kauai. A recovery plan was produced for this species in 1983 (U.S. Fish and Wildlife Service [USFWS] 1983). The Newell’s shearwater nests in the interior mountains of Kauai from April to November. Adult birds leave the nesting sites and head toward the open ocean, often flying at night. During this nocturnal relocation, the birds may become blinded or disoriented by urban lights, resulting in collisions with power lines, light posts, buildings, and other structures.

The dark-rumped petrel (*Pterodrome phaeopygia sandwicense*) is a federally listed endangered bird found on Kauai. The dark-rumped petrel, also commonly referred to as the Hawaiian petrel, exhibits a life history similar to that of the Newell’s shearwater. Adult birds nest in the interior portions of the island...
through the summer months. Fledging occurs in October, at which point adult birds return to the open ocean. Dark-rumped petrels may travel though the PMRF main base area during this relocation (U.S. Navy 1998). The open ocean of the project area may be used as a foraging area for this species (U.S. Navy 2005b). Avian surveys in support of the INRMP did not identify this species in the vicinity of Barking Sands (Appendix B to the INRMP [U.S. Navy 2001]). Threats to the dark-rumped petrel include degradation of nesting habitat and predation by feral animals.

The short-tailed albatross (*Phoebastria albatrius*) is an endangered species that is not known to regularly inhabit the PMRF at Barking Sands, but one individual was tentatively identified in the area in 2000 (section 6.5 of the INRMP [U.S. Navy 2001]). The short-tailed albatross is highly migratory, nesting on two Japanese islands and traveling to islands in the Bering Sea and the northwestern Hawaiian Islands. The probability of presence of this species in the project area is remote, but the open ocean of the project area may be used during the short-tailed albatross’s migration.

**Marine Mammals**

All marine mammals are protected under the MMPA of 1972 as amended (16 U.S. Code [USC] 1431 et seq.), and some species are also protected by the Endangered Species Act (ESA) of 1973 (16 USC 1531). Marine mammals listed as threatened or endangered under the ESA are also automatically considered “depleted” under MMPA. The EIS and INRMP for PMRF (U.S. Navy 1998, 2001) and the Marine Resources Assessment for the Hawaiian Operating Area (U.S. Navy 2005b) identify 2 pinnipeds and 30 cetaceans that may occur in or near the waters off of Barking Sands and the BSURE range. Seven of these species are federally listed under the Endangered Species Act: the Hawaiian monk seal (*Monachus schauinslandi*), humpback whale (*Megaptera novaeangliae*), sperm whale (*Physeter macrocephalus*), blue whale (*Balaenoptera musculus*), fin whale (*Balaenoptera physalus*), sei whale (*Balaenoptera borealis*), and North Pacific right whale (*Eubalaena japonica*). The occurrence of marine mammals in the project area is summarized in **Table 3-1**, which is followed by individual species accounts.
<table>
<thead>
<tr>
<th>Common name</th>
<th>Scientific name</th>
<th>ESA/MMPA Status*</th>
<th>Likelihood of Occurrence in Project Area**</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LISTED CETACEANS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Whale</td>
<td><em>Balaenoptera musculus</em></td>
<td>Endangered/Depleted</td>
<td>Unlikely due to rarity</td>
</tr>
<tr>
<td>Fin Whale</td>
<td><em>Balaenoptera physalus</em></td>
<td>Endangered/Depleted</td>
<td>Unlikely (rare, fall-winter only),</td>
</tr>
<tr>
<td>Humpback Whale</td>
<td><em>Megaptera novaeangliae</em></td>
<td>Endangered/Depleted</td>
<td>Likely, especially from December to May</td>
</tr>
<tr>
<td>North Pacific Right Whale</td>
<td><em>Eubalaena japonica</em></td>
<td>Endangered/Depleted</td>
<td>Unlikely due to rarity</td>
</tr>
<tr>
<td>Sperm Whale</td>
<td><em>Physeter macrocephalus</em></td>
<td>Endangered/Depleted</td>
<td>Likely during summer, offshore</td>
</tr>
<tr>
<td>Sei Whale</td>
<td><em>Balaenoptera borealis</em></td>
<td>Endangered/Depleted</td>
<td>Unlikely (rare, offshore only)</td>
</tr>
<tr>
<td><strong>NON-LISTED CETACEANS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bryde’s Whale</td>
<td><em>Balaenoptera edeni</em></td>
<td>Not listed</td>
<td>Likely</td>
</tr>
<tr>
<td>Minke Whale</td>
<td><em>Balaenoptera acutotostrata</em></td>
<td>Not listed</td>
<td>Unlikely (rare, mostly summer-fall)</td>
</tr>
<tr>
<td>Blainville’s Beaked Whale</td>
<td><em>Mesoplodon densirostris</em></td>
<td>Not listed</td>
<td>Likely</td>
</tr>
<tr>
<td>Pygmy Killer Whale</td>
<td><em>Feresa attenuata</em></td>
<td>Not listed</td>
<td>Likely</td>
</tr>
<tr>
<td>Short-finned Pilot Whale</td>
<td><em>Globicephala macrorhynchus</em></td>
<td>Not listed</td>
<td>Likely</td>
</tr>
<tr>
<td>Risso’s Dolphin</td>
<td><em>Grampus griseus</em></td>
<td>Not listed</td>
<td>Likely</td>
</tr>
<tr>
<td>Longman’s Beaked Whale</td>
<td><em>Indopacetus pacificus</em></td>
<td>Not listed</td>
<td>Likely</td>
</tr>
<tr>
<td>Pygmy Sperm Whale</td>
<td><em>Kogia breviceps</em></td>
<td>Not listed</td>
<td>Likely</td>
</tr>
<tr>
<td>Dwarf Sperm Whale</td>
<td><em>Kogia sima</em></td>
<td>Not listed</td>
<td>Likely</td>
</tr>
<tr>
<td>Fraser’s Dolphin</td>
<td><em>Lagenodelphis hosei</em></td>
<td>Not listed</td>
<td>Unlikely, rarely sighted</td>
</tr>
<tr>
<td>Killer Whale</td>
<td><em>Orcinus Orca</em></td>
<td>Not listed</td>
<td>Unlikely</td>
</tr>
<tr>
<td>Melon-headed Whale</td>
<td><em>Peponocephala electra</em></td>
<td>Not listed</td>
<td>Likely</td>
</tr>
<tr>
<td>False Killer Whale</td>
<td><em>Pseudorca crassidens</em></td>
<td>Not listed</td>
<td>Likely</td>
</tr>
<tr>
<td>Pantropical Spotted Dolphin</td>
<td><em>Stenella attenuata</em></td>
<td>Not listed</td>
<td>Likely</td>
</tr>
<tr>
<td>Striped Dolphin</td>
<td><em>Stenella coeruleoalba</em></td>
<td>Not listed</td>
<td>Likely</td>
</tr>
<tr>
<td>Spinner Dolphin</td>
<td><em>Stenella longirostris</em></td>
<td>Not listed</td>
<td>Likely, mostly close to shore</td>
</tr>
</tbody>
</table>

(Table continues on next page)
<table>
<thead>
<tr>
<th>Common name</th>
<th>Scientific name</th>
<th>ESA/MMPA Status*</th>
<th>Likelihood of Occurrence in Project Area**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rough-toothed Dolphin</td>
<td>Steno bredanensis</td>
<td>Not listed</td>
<td>Likely</td>
</tr>
<tr>
<td>Common Bottlenose Dolphin</td>
<td>Tursiops truncatus</td>
<td>Not listed</td>
<td>Likely</td>
</tr>
<tr>
<td>Cuvier’s Beaked Whale</td>
<td>Ziphius cavirostris</td>
<td>Not listed</td>
<td>Likely</td>
</tr>
</tbody>
</table>

**Pinnipeds**

<table>
<thead>
<tr>
<th>Common name</th>
<th>Scientific name</th>
<th>ESA/MMPA Status*</th>
<th>Likelihood of Occurrence in Project Area**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawaiian Monk Seal</td>
<td>Monachus schauinslandi</td>
<td>Endangered/Depleted</td>
<td>Likely, mostly close to shore</td>
</tr>
<tr>
<td>Northern Elephant Seal</td>
<td>Mirounga angustirostris</td>
<td>Not listed</td>
<td>Unlikely, outside known range</td>
</tr>
</tbody>
</table>

* All marine mammals are protected by the MMPA. Threatened and/or endangered status describes listing under ESA. Depleted status describes additional protections under MMPA.


**Hawaiian Monk Seal**

The Hawaiian monk seal (Monachus schauinslandi) is federally listed as endangered and considered a “strategic” stock under the MMPA. This species is found in waters surrounding all of the Hawaiian Islands. Critical habitat has been designated at haul out sites and out to a depth of 120 ft (36 m) in 10 locations in the Northwest Hawaiian Islands. No critical habitat is designated at Barking Sands or within the BSURE coverage area (U.S. Navy 2005b). Hawaiian monk seals haul out on beaches at Barking Sands and have occasionally used the area for pupping (section 4.6.4.4 of the INRMP [U.S. Navy 2001]). Seals may haul out and bask up to the high-berm vegetation along the beaches (U.S. Navy 2005a). The Hawaiian monk seal forages in waters less than 100 m deep near breeding atolls and seamounts. The proposed drill site is a flat, grassy area located inland of the coastal berms and dunes and is not close enough to the shoreline to provide habitat for this species (Figure 3-2). The primary area of occurrence is in waters less than 500 m deep, while the secondary area of occurrence extends to the 1000-m isobath.

**Humpback Whale**

The endangered humpback whale (Megaptera novaeangliae), also considered depleted under the MMPA, is present throughout Hawaiian waters during its winter breeding season from December through May. Humpback whales in Hawaiian waters are considered part of the central North Pacific stock (Angliss and Lodge 2004). Humpback whales most often occur within the 985-ft (300-m) depth contour of the Hawaiian Islands during winter months. The Hawaiian Islands Humpback Whale National Marine Sanctuary includes a portion of the ocean north of Kauai, but not within the Barking Sands PMRF vicinity or in the BSURE coverage area.

**Sperm Whale**

The sperm whale is an endangered marine species, also considered depleted under the MMPA, that has been observed surrounding the Hawaiian Island (NMFS 2006). The majority of sperm whales are thought to spend winter months in waters below 40º latitude, and are distributed throughout the entire north Pacific in summer months. Sperm whales that may be present around Kauai are considered part of the...
Hawaiian Stock. Sperm whales are typically observed in offshore waters more frequently than in coastal areas. This species may occur within 12 nm of the west coast of Kauai.

**Blue Whale**

The blue whale is an endangered species, also considered depleted under the MMPA, and is the largest living animal, with adults in the Northern Hemisphere reaching from 75.1 to 91.9 ft (22.9 to 28 m) in length. Blue whale occurrence is rare in shallow, shelf waters (NOAA 2005). In the western North Pacific, blue whale call locations were correlated with cold, productive waters (U.S. Navy 2005b). Blue whale calls have been documented in low densities in the Hawaii Operating Area. The calls indicate that the animals occur within several hundred miles of the Hawaiian Islands. Blue whales occur most often in waters greater than 323 ft (100 m) deep (U.S. Navy 2005b). The blue whale is a rare inhabitant of the area, but may occur within 12 nm of the west coast of Kauai.

**Fin Whale**

The fin whale, listed as endangered under the ESA and depleted under the MMPA, is the second-largest whale species, reaching 78.7 ft (24 m) in length. Fin whales feed on a wide variety of small, schooling prey (especially herring, capelin, and sand lance), as well as squid and crustaceans (krill and copepods). Unlike sei whales, fin whales are asymmetrically colored, with the right side of their jaw being white while the left is grey. Fin whales are the fastest swimming rorqual species (blue, fin, sei, and minke whales) and can travel in excess of 20 knots.

Fin whales are broadly distributed throughout the world’s oceans in continental shelf and deeper waters. The overall range of fin whales in the eastern Pacific Ocean extends from the Gulf of Alaska to the Baja Peninsula and the Sea of Cortez. This species tends to congregate in locations where prey is most plentiful, such as over banks, ledges, or along the continental shelf break. These locations may shift seasonally or annually depending on physical ocean conditions and weather patterns. The winter range of most rorquals is thought to be in offshore waters. Fin whales are generally uncommon in Hawaiian waters. Primary occurrence is seaward of the 328-ft (100-m) isobath during fall and winter, but this species may occur within 12 nm of the west coast of Kauai.

**Sei Whale**

Adult sei whales can grow to 59 ft (18 m) in length; they are extremely similar in appearance to Bryde’s whales and difficult to differentiate at sea or even when stranded on the beach. Sei whales feed by “gulping” and “skimming” plankton close to or at the surface of the water.

Sei whales are found in all oceans but are more restricted to mid-latitude temperate waters than other rorquals. The species is uncommon in most tropical regions. Like other rorquals, the sei whale undertakes long migrations during spring and fall. Sei whales are also known for occasional irruptive occurrences in areas where they are not typically seen. Sei whales are distributed far offshore and are not necessarily associated with the coastline, instead appearing to prefer regions of steep bathymetric relief, such as the continental shelf break or submarine canyons. These areas are often the location of persistent hydrographic features, where upwelling currents frequently develop. The sei whale is considered rare in Hawaiian waters. The sei whale is listed as endangered under the ESA, and as depleted and strategic under MMPA. Accurate abundance estimates have not been made, although the population is likely to be small. The potential occurrence of sei whales within 12 nm of the PMRF shoreline is remote.
**Northern Pacific Right Whale**

The Northern Pacific right whale is a large, slow swimming species that typically grows to 30 to 56 ft (9 to 17 m) long. Migratory patterns of the North Pacific stock of this species are unknown, although the whales are thought to spend summer in high-latitudes and migrate southward during winter months (Braham and Rice 1984; NOAA 2005). The range of the species encompasses nearly the entire temperate Pacific Ocean. Calving occurs in coastal waters during winter months. Abundance estimates for this species are inconclusive based on insufficient data, although the population is probably very small (NOAA 2005). The Northern Pacific Right Whale is listed as an endangered species, thus all stocks of the species are considered depleted and strategic under MMPA.

Generally, the species is quite rare throughout the Pacific Ocean; it may be the most endangered large whale species (U.S. Navy 2005b). There are only a few records of the North Pacific right whale in Hawaiian waters, both in shallow and deep waters. The species may occur in the project area, but is expected to be quite rare.

**Other Marine Mammals**

Along with the Hawaiian monk seal and federally listed cetaceans, the northern elephant seal (*Mirounga angustirostris*) and 24 additional cetaceans may occur in or near the waters off of Barking Sands and within the BSURE range (U.S. Navy 1998, U.S. Navy 2001, U.S. Navy 2005b). These species are protected under the MMPA, but are not federally listed as threatened or endangered. The northern elephant seal is only rarely sighted in Hawaiian waters and is considered an extralimital vagrant (U.S. Navy 2005b). The spinner dolphin (*Stenella longirostris*) occurs closer to shore at Barking Sands than any of the other cetaceans. The spinner dolphin inhabits bays and protected waters, often in waters less than 40 ft deep (U.S. Navy 2001). The INRMP (U.S. Navy 2001) and the Marine Resources Assessment for the Hawaiian OPAREA (U.S. Navy 2005b) provide detailed descriptions of these species and their habitats within the project area.

**ESA-Listed Sea Turtles**

Five sea turtle species are known to occur in Hawaiian waters, the green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), loggerhead (*Caretta caretta*), olive ridley (*Lepidochelys olivacea*), and leatherback (*Dermochelys coriacea*). All five of these species are federally protected as threatened or endangered. Of these, the threatened green sea turtle is the most frequently sighted turtle in the Barking Sands PMRF area (U.S. Navy 2005a). **Table 3-2** lists species of sea turtles that may be found within the project area; species accounts follow.
Table 3-2  Sea Turtle Occurrence in the Project Area

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Status</th>
<th>Likelihood of Occurrence in Project Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green sea turtle</td>
<td><em>Chelonia mydas</em></td>
<td>Threatened</td>
<td>Unlikely; rare both offshore and onshore in this area</td>
</tr>
<tr>
<td>Hawksbill sea turtle</td>
<td><em>Eretmochelys imbricata</em></td>
<td>Endangered</td>
<td>Unlikely; rare offshore, never seen onshore in this area.</td>
</tr>
<tr>
<td>Leatherback sea turtle</td>
<td><em>Dermochelys coriacea</em></td>
<td>Endangered</td>
<td>Very unlikely; rarely sighted</td>
</tr>
<tr>
<td>Loggerhead sea turtle</td>
<td><em>Caretta caretta</em></td>
<td>Threatened</td>
<td>Very unlikely; rarely sighted</td>
</tr>
<tr>
<td>Olive ridley sea turtle</td>
<td><em>Lepidochelys olivacea</em></td>
<td>Threatened</td>
<td>Very unlikely; rarely sighted</td>
</tr>
</tbody>
</table>


Green Sea Turtle

Adult green sea turtles typically rest during the day in coastal waters along ledges or rock formations in waters 40 to 80 ft (12-24 m) deep. At night, the turtles travel inshore to forage on algae. Juvenile turtles live a predominantly pelagic life until they reach approximately 12 inches (4.7 cm) in length and then settle in nearshore waters.

Green sea turtles are often sighted near shore in the vicinity of the Nohili Ditch, approximately 1,900 ft (580 m) north of the onshore drilling site (Dollar and Brock 2006). A shallow sea floor depression directly offshore of Nohili Ditch (Figure 3-2) frequently attracts resting green sea turtles. Green sea turtles have nested in sandy beaches surrounding the confluence of the Ditch with the Pacific Ocean. Most of the green turtle sightings are within 164 ft (50 m) of Nohili Ditch, likely due to enriched algae communities in the outflow and surrounding waters. Green sea turtles at Barking Sands PMRF have been only infrequently sighted 164 ft (50 m) and further seaward from the shoreline (section 4.6.4.4 of the INRMP [U.S. Navy 2001]; U.S. Navy 2005a). Green sea turtles are unlikely to be found onshore within the project area as they are almost exclusively found near the Nohili Ditch and not in this area.

Hawksbill Sea Turtle

The endangered hawksbill sea turtle occurs in coastal waters around the eight main Hawaiian Islands, but is much less abundant than the green sea turtle (U.S. Navy 2005a, 2005b, 2006). The area of primary occurrence is within the 328-ft (100-m) isobath. Hawksbills have been sighted off the western shore of Kauai, but have not been identified near shore or nesting.

Other Sea Turtles

The leatherback, loggerhead, and olive ridley sea turtles, while known to occur occasionally in Hawaiian waters, have not been sighted in or near Barking Sands PMRF or the BSURE coverage area (U.S. Navy 2005a, 2005b) (NMFS and USFWS 1998a-d).
**Essential Fish Habitat**

Under the direction of the Magnuson Stevens Fishery Conservation and Management Act, Essential Fish Habitat (EFH) is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, and growth to maturity. This includes the marine areas and their chemical and biological properties that are utilized by the organism. Substrate includes sediment, hard bottom, and other structural relief underlying the water column along with their associated biological communities. EFH is designated in Hawaiian waters by the Western Pacific Region Fishery Management Council (WPRFMC). WPRFMC designated EFH for five groups of species under their respective Fishery Management Plans (FMPs): pelagics, crustaceans, coral reefs, precious corals, and bottomfish/seamount groundfish. In addition to and as a subset of EFH, the WPRFMC identified Habitat Areas of Particular Concern (HAPC) based on the following criteria: ecological function of the habitat is important; habitat is sensitive to anthropogenic degradation; development activities are or will stress the habitat; or the habitat type is rare. **Table 3-3** summarizes EFH and HAPC for the five Western Pacific FMPs. Within and including the 12 nm limit (NEPA portion of the project area), EFH is present for pelagics, bottomfish, crustaceans, and coral reef ecosystems.
### Table 3-3 Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC) for all Western Pacific FMPs

<table>
<thead>
<tr>
<th>FMP*</th>
<th>EFH (Juveniles and Adults)</th>
<th>EFH (Eggs and Larvae)</th>
<th>HAPC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pelagics*</td>
<td>Water column down to 1,000 m</td>
<td>Water column down to 200 m</td>
<td>Water column above seamounts and banks down to 1,000 m</td>
</tr>
<tr>
<td>Bottomfish* and Seamount Groundfish</td>
<td>Bottomfish: Water column and bottom habitat down to 400 m</td>
<td>Bottomfish: Water column down to 400 m</td>
<td>Bottomfish: All escarpments and slopes between 40-280 m, and three known areas of juvenile opakapaka (Pristipomoides filamentosus) habitat Seamount Groundfish: not identified</td>
</tr>
<tr>
<td>Precious Corals</td>
<td>Keahole Point, Makapuu, Kaena Point, Westpac, Brooks Bank, 180 Fathom Bank deep water precious corals (gold and red) beds and Milolii, Auau Channel and S. Kauai black coral beds</td>
<td>Not applicable</td>
<td>Makapuu, Westpac, and Brooks Bank deep water precious corals beds and the Auau Channel black coral bed</td>
</tr>
<tr>
<td>Crustaceans*</td>
<td>Bottom habitat from shoreline to a depth of 100 m</td>
<td>Water column down to 150 m</td>
<td>All banks within the Northwestern Hawaiian Islands (NWHI) with summits less than 30 m</td>
</tr>
<tr>
<td>Coral Reef Ecosystems*</td>
<td>Water column and benthic substrate to a depth of 100 m</td>
<td>Water column and benthic substrate to a depth of 100 m</td>
<td>All MPAs identified in FMP, all Pacific Remote Island Areas (PRIA), many specific areas of coral reef habitat (see FMP)</td>
</tr>
</tbody>
</table>

Source: WPRFMC 2004. All areas are bounded by the shoreline and the outer boundary of the Exclusive Economic Zone, unless otherwise indicated. * Indicates that EFH is present in the 12nm (NEPA) portion of the project area.

#### 3.1.4 Cultural Resources

The onshore construction area is considered a “low sensitivity” region for cultural resources (U.S. Navy 2005a). There are known traditional Hawaiian burials (Sites 05-1884, 05-1861) in the sand dunes between the drill site and the coastline (U.S. Navy 2005a). A World War II military dump site (05-2043) is located near the onshore project area, but outside the area of ground disturbance. The Integrated Cultural Resources Management Plan (ICRMP) designates this site as non-significant and ineligible for listing on the National Register of Historic Places (NRHP) (U.S. Navy 2005a).

Within nearshore and offshore waters of the PMRF are a sparse distribution of shipwrecks and fishponds. According to the National Oceanic and Atmospheric Administration’s shipwreck maps, there are two known wrecks and two Native Hawaiian fishponds in the vicinity of PMRF. Both of the wrecks and one
fishpond are near the northern extreme of the facility’s shoreline (approximately 5.3 miles north of Majors Bay); the second fishpond is in central PMRF (near the Kawaiele Ditch approximately 2.6 mi north of Majors Bay). The two known shipwrecks and Native Hawaiian fishponds in the vicinity of PMRF are not within the region of influence for the Proposed Action.

3.1.5 Land and Water Use

The land portion of PMRF is federally owned and controlled. The offshore waters to 3 nm offshore are within the State’s coastal zone.

PMRF’s land use is managed via the 2006 Comprehensive Infrastructure Plan. The plan promotes efficient, effective use of resources through a consolidation of like land uses and the minimization, recognition, and deconfliction of existing constraints. The plan supports the protection of essential mission operations from encroachment and the protection of human and natural environments (U.S. Department of the Navy, 2006b, U.S. Department of the Navy, 1998a).

Onshore, the Proposed Action is limited to the historical work site at PMRF. This area has been the location of the cable terminus and shore landing for all previous cable installations and repairs from 1967 to the present day.

No public beach access is currently available near the site of the Proposed Action. The closest accessible areas are located to the south past the KiniKini Ditch and to the north at Polihale State Park (Figure 2-1).

The offshore waters containing BSURE are not restricted from public use, but their use is limited by the fact that they are within a warning area, W-188 where military training exercises that are potentially hazardous to the public occur on a continuous basis. Additionally, since the events of September 11, 2001 and associated increases in security at PMRF, fishery use in this area has decreased. While fishing is still allowed, the increased security measures may have created a perception that fishing is restricted (Dollar and Brock 2006).

There are no federally designated wilderness areas, wildlife refuges, marine sanctuaries, or parklands in or near the project area. The Hawaiian Islands Humpback Whale National Marine Sanctuary includes a portion of the ocean north of Kauai, but not within the Barking Sands PMRF vicinity or in the BSURE coverage area.

3.1.6 Noise

This section addresses noise in the vicinity of the onshore construction (HDD) site and in the marine environment to 12 nm from shore. Relatively loud, intermittent sources of noise on PMRF include airfield and range operations, and missile launches. Wind, surf, wildlife, and road traffic are sources of ambient noise. Airfield operations include take-offs and landings of fixed-wing craft and helicopters, as well as engine maintenance activities. Airfield noise contours have been created based on modeling aircraft operations in 2004 and projected operations in 2009 (U.S. Navy, Engineering Field Activity Chesapeake 2006). Ambient noise levels in the vicinity of the onshore and offshore construction sites were estimated as being less than 55 dB based on 2004 airfield operations, but are projected to increase in 2009 to 65-70 dB at the onshore construction site, and to 75-80 dB at the offshore construction site (Figure 3-3). Missile launches are another source of relatively loud noise at PMRF. Missile launches occur regularly from the Kauai Test Facility and PMRF Launch Area (both 1-2 miles north of the HDD site). Launches from these sites typically produce sound levels of between 92 and 115 dBA (A-weighted decibels) in the area surrounding the proposed onshore and offshore construction sites (U.S. Navy 1998).
Figure 3-3
PMRF Noise Contours for 2009 Prospective Flight Operations

In the offshore BSURE environment, additional airborne noise sources include, but are not limited to, vessel engines, power generation, aircraft, weapons firing, maintenance, and construction. Active weapons include bombs, gunfire, missiles, rockets, small arms. These operations take place at sea, where few or no human receptors are exposed to the noise. Noise sources offshore are transitory and widely dispersed. Underwater noise sources include natural and manmade noises at the surface, which propagate downward into the water column; the ongoing activities of ASW training, which are addressed in the HRC EIS/OEIS; underwater geological activity (volcanism, landslides, earthquakes); and biogenic sources such as cetaceans and snapping shrimp.

3.2 AREA SUBJECT TO EO 12114: OPEN OCEAN (>12NM)

3.2.1 Geology

At distances greater than 12 nm offshore, soft substrate is predominant over the flat bathymetry of the abyssal plain. The abyssal plain constantly accumulates biotic and abiotic sediments that fall from the overlying water column. Mineral sediments are typically volcanic or marine (carbonate) in origin. Falling sediments settle into depressions in the sea floor, creating a very smooth, flat, and deep layer of unconsolidated sediments. Unconsolidated sediments cover the volcanic bedrock, ranging from coarse-textured coral, shell, and lava fragments at the shallower end to fine siliceous and calcareous oozes in deep water. The abyssal plain surrounding the Hawaiian Islands also contains cobbles formed of precipitated manganese (U.S. Navy 2005b). The nodules may reach several inches in diameter.

Substrate conditions in BSURE have not been investigated in detail, but should be representative of the transition from the lower insular slope into the abyssal plain as described above, generally consisting of unconsolidated sediments of varying depth and composition over volcanic bedrock (U.S. Navy 2005b).

The offshore geology of the Hawaiian Islands is marked by occasional areas of hard bottom substrate at seamounts. Seamounts are isolated rocky features on the sea floor where magma has risen to the sea floor and erupted, forming an outcropping in the surrounding flat landscape. Seamounts are not well studied and are poorly understood, but generally provide unique habitat for deep sea organisms. No seamounts are present in the vicinity of BSURE (U.S. Navy 2005b).

3.2.2 Water Quality

The pelagic zone of the Hawaiian Islands extends from the surface to depths greater than 20,000 ft (6,000 m) (U.S. Navy 2005b). Water quality in this zone, which includes BSURE, is presumed to be excellent, as runoff and effluent from land is discharged into the neritic zone near the shoreline. The open ocean near the Hawaiian Islands exhibits high water clarity, low quantities suspended material, and low concentrations of trace metals and hydrocarbons (U.S. Navy 2002). The coastal current system surrounding the Hawaiian Islands has a strong flow and exchange with offshore waters (U.S. Navy 2005b), diluting and dispersing sediment and pollutants.

3.2.3 Biological Resources

In this section, marine biological resources, such as aquatic vegetation, marine wildlife, threatened and endangered species, sea turtles, and marine mammals are discussed in relation to the offshore project area further than 12 nm offshore, including the benthos and pelagic waters.

Marine Habitats

Marine habitats in the offshore project area include open water (pelagic) habitats and deep benthic habitats. Pelagic habitats include the waters overlying abyssal habitats offshore, from the surface waters
to depths ranging from 660 ft (200 m) to 20,000 ft (6,000 m). In Hawaiian waters, the pelagic environment is usually pristine. Water patterns are characterized by large scale currents, deep eddies, storm swells, and wind swells.

The abyssal plain provides a deep layer of soft sediments, supporting a diverse but sparse benthic assemblage. Living plants are rare to absent on the seafloor due to lack of light. Owing to great depths, temperatures are virtually constant at 4 degrees Celsius; ecological communities are dominated by scavengers and opportunistic predators that depend on the rain of organic detritus from above.

Benthic habitat within BSURE has not been surveyed but is assumed to consist predominantly of unconsolidated sediments of varying depths and composition and supporting a variety of suspension- and deposit-feeding invertebrates and their predators (U.S. Navy 2005b). Non reef-forming, deep-sea corals can occur as isolated colonies. No precious coral beds or other unusual habitats are known to occur west of Kauai in the vicinity of BSURE, which is generally below the depths at which precious corals occur (U.S. Navy 2005b).

Benthic assemblages are affected by depth and substrate. Hard, irregular surfaces exhibit high abundance and diversity. Smooth surfaces are utilized by fish and wildlife to a lesser degree. Soft bottom habitats support a less abundant and less diverse assemblage than hard bottom substrate. Generally, abundance decreases with depth while diversity increases (U.S. Navy 2005b).

Unconsolidated sediments in the deep benthos may support cone shells (Conus spp.), tritons (Charonia spp.), pen shells (Pinna spp.), and deep-sea corals (U.S. Navy 2005b; Smith et al. 2006). The deep benthos of the abyssal plain (10,000 to 16,000 ft [3,000 to 5,000 m] deep) is inhabited by diverse crustaceans, polychaetes, elasipod holothurians (a type of sea cucumber), and other invertebrates that are adapted to extreme pressure, cold temperatures, and unique feeding opportunities on the seafloor. These benthic organisms depend on organic fallout from the upper waters for nutrient and carbon input. Suspension feeders filter water and obtain nutrients by capturing plankton and detritus that drifts through the currents along the seafloor. Deposit feeders inhabit the sediments and obtain nutrition by ingesting sediments and absorbing the organic detritus. Fishes of deep benthic habitats are poorly known due to the great depth and inaccessibility of the environment. Macrourids (rattails, grenadiers) are the most abundant fishes of the abyssal region and (Smith et al. 2006). Productivity is generally low, reflecting the dependence of the food chain on the rain of detritus from above, and scavenging species and opportunistic predators are most prevalent.

Special-Status Species

ESA-Listed Seabirds

ESA-listed seabirds that may occur in the project area at distances greater than 12 nm from shore include the Newell’s shearwater, the dark-rumped petrel, and the short-tailed albatross. As these species are also found within 12 nm of shore, they were discussed in detail in the previous section. Please refer to section 3.1.3.2 for more information on these species.

Marine Mammals

This section describes marine mammal species that may occur within the BSURE project area at a distance greater than 12 nm offshore. As described in section 3.1.3, the EIS and INRMP for PMRF (U.S. Navy 1998, 2001) and the Marine Resources Assessment for the Hawaiian Operating Area (U.S. Navy 2005b) identify 2 pinnipeds and 30 cetaceans that may occur in or near the waters off of Barking Sands and the BSURE range, seven of which are federally listed under the Endangered Species Act (Table 3-1).
This section includes only the information relevant to areas greater than 12 nm offshore. For more detailed information on the life history of these species, please see section 3.1.3.

**Hawaiian Monk Seal**

Hawaiian monk seals are rare in waters seaward of the 1,000-m isobath (U.S. Navy 2005b). The project area 12 nm from shore is beyond the 1,000-m isobath, therefore the Hawaiian monk seals are expected to be rare to absent.

**Humpback Whale**

Humpback whales may occur in this area but they most often occur closer to shore, within the 985-ft (300-m) depth contour, of the Hawaiian Islands during winter months.

**Sperm Whale**

Sperm whales are typically observed in offshore waters more frequently than in coastal areas. This species may occur in waters of the BSURE range.

**Blue Whale**

Globally, blue whales are primarily found in deep, offshore waters distributed from the ice edge to the subtropics in both hemispheres. In the western North Pacific, blue whale call locations were correlated with cold, productive waters (U.S. Navy 2005b). Blue whale calls have been documented in low densities in the Hawaii Operating Area. The calls indicate that the animals occur within several hundred miles of the Hawaiian Islands. Blue whales occur most often in waters greater than 323 ft (100 m) deep (U.S. Navy 2005b). The blue whale is a rare inhabitant of the area, but may occur in the waters of BSURE.

**Fin Whale**

Fin whales are generally uncommon in Hawaiian waters. The winter range of most rorquals is thought to be in offshore waters. Primary occurrence is seaward of the 323-ft (100-m) isobath during fall and winter.

**Sei Whale**

The sei whale is considered rare in Hawaiian waters. Occurrence is more likely, but still rare, in waters to the north of the islands in waters greater than 1,000 m in depth. Sei whales may occur in low densities in the offshore project area of BSURE.

**North Pacific Right Whale**

There are only a few records of the North Pacific right whale in Hawaiian waters, both in shallow and deep waters. The species may occur in the offshore project area, but is expected to be rare.

**ESA-Listed Sea Turtles**

The green sea turtle and the hawksbill sea turtle are both rarely found greater than 12 nm offshore, as they generally inhabit shallower waters. The leatherback, loggerhead, and olive ridley sea turtles are rarely sited in the area. Because of this, it is unlikely that sea turtles occur in the project area greater than 12 nm from shore. Table 3-2 summarizes the likelihood of occurrence of sea turtles in the project vicinity.

**Essential Fish Habitat (EFH)**

The waters greater than 12 nm from shore plunge to great depths. The underlying aphotic zone, which receives no sunlight, is characterized by cold, dark conditions with much less biological activity than the
upper euphotic zone, which receives sunlight (U.S. Navy 2005b). An oxygen minimum zone at a depth of approximately 2,000 ft (600 m) causes a distinctive shift in the marine fauna in deeper waters.

Within the area of BSURE, EFH and HAPC are limited to the overlying water column habitat, where work would occur during the installation. Due to the great depth of the seafloor in this area (greater than 1,000 m), instruments on the seabed would be at depths beyond those of designated EFH or HAPC (Table 3-3).

As with the pelagic habitats closer to shore, marine mammals, fishes, sea turtles, crustaceans, and other invertebrates forage in the pelagic zone. Plankton drift throughout the pelagic zone and provide the basic energy source for larger fauna. In addition to great numbers of schooling fishes that feed on the plankton, the pelagic zone includes many larger, predatory species that constitute important fisheries, among them squids, sharks, tuna, albacore, marlin, and swordfish. Fish and invertebrates of the pelagic zone provide food resources for wide-ranging seabirds that include petrels, shearwaters, albatrosses, gulls, terns, and noddies (U.S. Navy 2005b).

3.2.4 Noise

The noise environment in the project area beyond 12 nm from shore is similar to the environment in offshore waters described in section 3.1.6. No quantitative data on ambient noise levels are available. Airborne noise sources include military and civilian aircraft and vessels, naval gunnery exercises, and the sound of wind, waves, and seabirds. Occasional sonic booms also result from missile launches over the ocean, although these are generally restricted to altitudes greater than 30,000 ft above sea level or areas at least 30 nm from shore. Sources of underwater sound include ship engine noise, noise associated with ASW training and the use of sonar (addressed in the HRC EIS/OEIS), biological sounds generated by cetaceans and other animals, and sounds produced by rainfall at the surface, submarine landslides, volcanic activity, and earthquakes.
CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

4.1 AREA SUBJECT TO NEPA: PMRF ONSHORE AND OFFSHORE (≤12NM)

4.1.1 Geology and Soils

Proposed Action

Significant impacts to geology and soils onshore would not occur as the Proposed Action is limited to the historical work site at PMRF. HDD operations, cable trenching, and associated construction activity would impact an estimated 1.3-acre (0.5 ha) semi-disturbed site. The HDD site and trenching routes have been altered by other projects in the area. Previous shore landings included trenching the cable across the beach and through the berm to the cable vaults. The trenches excavated for the proposed action would be back filled after the cable installation to stabilize the exposed soil. As noted in section 2.5, the Proposed Action would implement BMPs as necessary to control runoff, pollutants, and erosion/sedimentation as required under the NPDES general storm water permit for construction. Excess mud (160 barrels) and cuttings (103 cubic yards), would be trucked for disposal to the Kekaha Municipal Landfill (section 2.2.3). As indicated in section 2.2.3, native plant species would be mixed with the native soil to speed the restoration of excavated areas following construction.

The offshore area where the drill pipes would emerge (see Figure 2-7) is comprised mostly of non-living coral-limestone pavement overlaid by sand, with patches of live hard coral and deeper sand channels (Figure 2-6). The underwater construction site has been delineated to capture a zone of appropriate location, bathymetry, and depth that meet the project requirements. As described in section 2.2.4, relatively small patches within the underwater construction site boundary would be used for drill exit points and associated IWS hardware installation. The total area of substrate disturbance within the underwater construction site is estimated as 3,234 ft² (0.08 acre [0.03 ha]) (section 2.2.4), which includes the two bore exits on the seabed; trunk cable with split pipe from the bore exit to the J-box; J-box work area, where the overlying sand would be jetted away to allow the J-box to be secured to the underlying hard substrate; and four array cables laid on the substrate (secured where possible) extending seaward to approximately 100-ft (30 m) depth. The area of substrate disturbance represents 0.2 percent of the underwater construction site area. Hard substrate, where it occurs, would be subject to covering and abrasion or shallow excavation at the drill exits and where the equipment is installed. Divers would install the equipment and ensure the avoidance of live coral wherever possible. Disturbed sediments would rapidly disperse and settle without any adverse effect on seafloor geology. Given the relatively small areas affected and minor extent of alterations to the substrate, impacts to geology and soils in the offshore construction area would not be significant.

Impacts to geological resources in the offshore installation area of the cable array would be limited to the temporary disruption of sediment as the cable arrays fall to the seabed. Cables would be laid perpendicular, rather than parallel to, steep offshore slopes along the cable route. Perpendicular placement is more stable and reduces the risks of damage from underwater landslides or differential slippage of cable sections down side slopes. Array cables and nodes in BSURE would be placed within the existing tracking area. The total extent of temporary disturbance, assuming an average 12-inch (30 cm) wide area of disruption for the deployment of array cables for approximately 11 nm from the seaward limit of the underwater construction site to the 12-nm limit, would be roughly 6.14 acres (2.49 ha). As discussed in section 3.1, the affected areas are predominantly unconsolidated sediments of varying
composition; no unique features would be affected. The cables and instruments themselves within 12 nm, including the J-box and components within the underwater construction site, would constitute approximately 0.53 acre (0.21 ha) of new hard substrate. Because of the localized, temporary nature of the impact to substrates which occur over vast areas of the ocean bottom, there would be no significant impact to geology and soils in the marine environment.

The affected areas onshore and to 3 nm offshore are within the State’s coastal zone. As discussed in section 4.1.6, the proposed refurbishment has been determined to have insignificant effects on the coastal zone, and thereby qualifies as a de minimis activity (Appendix A). The installation of structures on the seabed within 3 nm would require a Section 10 Rivers and Harbors Act permit from the USACE, which would be obtained prior to installation activities.

**No Action Alternative**

Under the No Action Alternative, BSURE refurbishment would not occur. HDD would not occur and no array installation would be conducted. Continued age-related random failures and accidental damage to the 27 year old BSURE in-water hardware would continue to occur. Range tracking and communications capabilities would degrade or be completely stopped. The No Action alternative would lead to an increasingly likely event of sudden, complete failure. If this occurred, Mid-Pacific Fleet Submarine Training would be severely curtailed and additional repair actions would be needed. Future repairs, if required, would have minor, insignificant impacts on bottom substrates, similar to those of the Proposed Action but affecting a smaller area.

**4.1.2 Water Quality**

**Proposed Action**

The onshore portion of the Proposed Action would have no significant impact on water quality. Project activities would occur on a flat, sandy site that is fronted by a sand berm and lacks any surface water connections to the ocean or to the ditches and canals that drain the agricultural areas to the east (U.S. Navy 1998, 2001). As a result, any surface water (during rainfall) is unlikely to accumulate or flow off of the site, but would percolate rapidly into the sand. As noted in section 2.5, the Proposed Action would implement BMPs as necessary to control runoff, pollutants, and erosion/sedimentation as required under the NPDES general storm water permit for construction.

The onshore construction area and any excavated soil would be backfilled, and native vines and vegetation would be mixed with the backfill to promote soil stabilization. All work materials will be removed from the job site. The cumulative amount of time on-site is expected to be approximately nine weeks. It is estimated that the disturbed soil would return to pre-work appearance in about six months. No sediment transport to the ocean is anticipated. Non-point source pollution would not occur and a permit would not be required.

The offshore cables consist of metallic and synthetic, essentially inert materials (glass fibers, plastic (polyethylene), copper, steel, waterproof nylon yarn). Based on observations of underwater cables off Kauai (Office of Naval Research 2001) and elsewhere (NAVFAC Atlantic Division 2004, Monterey Bay Aquarium Research Institute (MBARI) 2003, Ocean City Reef Foundation 2004), the replacement cables, like the existing cables, will soon also be covered with marine growth or buried by sand, and would not break down for a very long period of time. Ultimately, as these components disintegrate, decompose, or corrode, the constituent elements would be dispersed into surrounding media, with no effect on sediment or water quality.
The Proposed Action does not involve ordnance or explosives and will not introduce any explosive hazard or explosive safety quantity distance (ESQD) arcs and it would not generate any chemical hazards. The only hazardous substances that would be used in the proposed project are lubricants and fuel contained in construction vehicles, vessels, and equipment. PMRF activities follow the appropriate State and Federal requirements for the management of hazardous materials and hazardous waste. All vehicles would be properly maintained and inspected to reduce the risk of leakage. PMRF’s Spill Prevention Control and Countermeasures Plan and Installation Spill Contingency Plan would be implemented to minimize the likelihood of spills and to contain and remove any spills of petroleum-based fluids. Any handling and disposal of spilled or oily waste material would be in accordance with PMRF’s Hazardous Waste Management Plan. Adherence to these procedures on PMRF assures that there would be no significant impact due to spills during onshore construction.

The HDD process will not directly or cumulatively introduce toxic or hazardous substances or chemicals, organic substances, or solid wastes into bodies of water or on land to cause the level of these substances to exceed regulatory standards. The bentonite clay used in the drilling process is a non-toxic clay that is not a hazardous substance. It is possible that drilling mud could escape from the bore into surrounding the geologic formation. Any material migrating to the surface would be rapidly dispersed by wave and current action and would not be expected to persist or accumulate in appreciable amounts. The amount of clay in the drilling fluid is normally about 50 lbs (23 kg) of clay per 100 gallons (379 liters) of water. During the final stage of drilling, bentonite addition to the drilling fluid would be discontinued, and only water would be used, thus minimizing the release of the clay sediment when the bore exits the seabed. In addition, the drilling contractor would follow procedures established in the BSURE bentonite spill prevention plan, developed by the U.S. Navy specifically for the project (NUWC 2007). The proposed action would require and obtain a Section 10 Rivers and Harbors Act permit for the installation of structures in navigable waters, similar to other recent submarine cable installations by HDD (USACE 2007). Application to the USACE will be made following completion of the NEPA/EO 12114 process. Since no discharge of dredged or fill material is anticipated, a Section 404 Clean Water Act permit would not be required.

Small-scale increases in turbidity would occur due to installation of the cables and nodes on the seafloor. Turbidity would be minor and temporary throughout the refurbishment project. Sediments would rapidly disperse and/or settle back to the seabed. Coarse sediments (sand or larger) would resettle within seconds in the immediate area, whereas fines (silt to clay) would tend to drift and remain in suspension for minutes to hours, depending on particle sizes and bottom currents (U.S. Minerals Management Service 1999). There would be no permanent or significant effect on marine water quality due to suspended sediments. The outer layers of submarine cables are insoluble and readily become encrusted with marine organisms and are not expected to break down for decades. Inner metallic components are sealed from the surrounding media. Any by-products of corrosion or dissolution of cable components in seawater would be rapidly dispersed and diluted in the water column and as such would have no significant impact on water quality.

**No Action Alternative**

Under the No Action Alternative, BSURE refurbishment would not occur. HDD would not occur and no cable array installation would be conducted. The current degraded state of BSURE is vulnerable to damage, failure, and lowered operational functionality. Under the No Action Alternative, random failures and accidental damage to the BSURE in-water hardware would continue to occur and would continue to diminish range tracking and communications capabilities. The loss of operational capability and the need
for repairs would adversely impact ASW training. Future repairs, if required, would have minor, insignificant impacts on water quality, similar to those of the Proposed Action although affecting a smaller area.

4.1.3 Biological Resources

**Proposed Action**

**Onshore Habitat and Species**

The onshore construction site is a previously disturbed ruderal habitat, the use of which would not have a significant impact. Neither the lau ehu nor the ohai have been identified in surveys of the project vicinity (U.S. Navy 1998, 2001, USFWS 2003). The vegetation in the project area is semi-disturbed, located between areas of ruderal vegetation, Kiale-Koa Haole Scrub, and Naupaka vegetation (Figures 3-1, 3-2). HDD operations, cable trenching, and associated construction activity would impact an estimated 1.3 acres (0.5 ha) of semi-disturbed vegetation in the project site. The HDD site and trenching routes have been altered by other projects in the area. Previous shore landings included trenching the cable across the beach and through the berm to the cable vaults. The vegetation does not support protected plant species; thus the Proposed Action would have no effect, and therefore no significant impact on, federally listed endangered/threatened species.

**Offshore Habitat**

EO 13089 (Coral Reef Protection) requires all federal agencies whose actions may affect U.S. coral reef ecosystems to identify the actions that may harm coral reefs; utilize their programs and authorities to protect and enhance the ecosystems; and, to the extent permitted by law, ensure that any actions they authorize, fund, or carry out will not degrade the conditions of such ecosystems. Based on surveys conducted for the INRMP (Appendix C to U.S. Navy 2001; Dollar and Brock 2000, 2006) and as described in section 3.1.3, the offshore construction area is characterized by a pitted limestone surface, with sand-filled channels and potholes, becoming increasingly flat and sandy with increasing depth. Live coral cover occurs on approximately 5% of the substrate in the underwater construction site. The Proposed Action incorporates procedures to minimize potential impacts of the installation on live coral, and the presence of the equipment, once installed, would not adversely affect the coral reef ecosystem. The HDD installation of the trunk cable not only serves to protect the cable, but also protects sea floor substrate and coral reef habitat from damage due to cable trenching or cable drift. It also precludes any ground disturbance in the sensitive dune area and eliminates the need for future cable maintenance in the surf-zone. Hard and soft corals are sparsely distributed in the area, and an underwater survey has been used to configure the site over relatively flat bathymetry, with minimal coral colonization.

As described in section 1.4.2, it is possible that drilling mud could escape from the bore into the surrounding geologic formation. Any material migrating to the surface would be rapidly dispersed by wave and current action and would not be expected to persist or accumulate in appreciable amounts. During the final phase of drilling, drilling fluids will be switched from a mixture of clay and fresh water to water only. When the drill head exits the seafloor, there will be little or no release of clay or sediment. The conduit that would be installed in the drill bore is made of clean, uncoated pipe that would not release toxic or hazardous substances into the benthic environment.

The preferred J-box location was identified by a dive survey (NUWC 2007) as a sandy bottom, with a sand depth of 12-18 inches (0.3-0.45 meters) above and bordered by limestone substrate with small
patches of coral. The J-box would be unloaded from the installation vessel with commercial divers, per safe diving practices, guiding the structure into the planned location.

Surrounding the J-box, divers would stabilize the trunk cable on the seafloor with a combination of split pipe, metal rods and epoxy, and steel claps (see section 2.2.4). The cable will be laid taut against the seafloor, minimizing cable slack and the possibility of movement. Pig tails and offshore array cables would also be stabilized to the reef seaward of the J-box to approximately 100 ft (30 m) in depth at 200-ft (60-m) intervals. Stabilization would prevent cables from being swept into coral colonies by currents or entanglement with anchors.

The total area of physical disturbance to the seabed within the offshore construction site is estimated as 3,234 ft^2. This is approximately 0.18 percent of the offshore construction site area. Assuming 5% live coral cover on the substrate, then if the drill exits, cable placements, and J-box were randomly located, a total area of 162 ft^2 of live coral, consisting of small, scattered patches and/or isolated colonies, would be incidentally contacted and subject to covering, abrasion or breakage during the installation. The preferred J-box location and the planned deployment methods minimize the damage to patches of coral. Hence the extent of damage to living coral is expected to be less than 162 ft^2. The structure of the fossilized limestone reef throughout this area would not be affected, and the hardware would provide new substrate for coral recruitment (next paragraph). Accordingly, there would be no significant impact on corals and the reef ecosystem off PMRF.

Based on observations of underwater cables off Kauai (Office of Naval Research 2001; PMRF 1995-1996, Dollar and Brock 2006) and elsewhere (NAVFAC Atlantic Division 2004, MBARI 2003, Ocean City Reef Foundation 2004), the replacement cables, like the existing cables, and J-box will soon also be covered with marine growth or buried by sand, and in some places will completely disappear into the reef. Cable bolts and clamps would also provide substrate for benthic organisms and would eventually take on the appearance of the reef. A 2006 survey of marine and fishery resources in PMRF (Dollar and Brock 2006) found that the presence of cables and other man-made items resulted in an enhancement of the physical complexity of the marine habitats and provided settling locations for coral. The cables did not appear to result in any negative effects. As a result, there would be no significant impact on corals associated with the refurbishment hardware.

Diver activity during installation of the cables and associated hardware would temporarily increase turbidity in the immediate area, but the impact would be insignificant. The substrate in the underwater construction site is predominantly consolidated material, thus the suspended sediment plume would be minimal. Turbidity would quickly diminish and return to pre-disturbance conditions.

As described in section 4.1.2, no erosion or transport of sediment from the onshore construction site to the ocean would occur.

**ESA-Listed Species**

**Newell’s Shearwater**

The State recovery plan for the Newell’s shearwater lists recovery strategies, such as reducing collisions with structures and disorientation by lights (Hawaii Department of Land and Natural Resources 2005). The most critical time periods for Newell’s shearwater migration are one week before and after the new moon in October and November. Construction would not occur during these periods. Downward shielding of lights is a standard practice being implemented on PMRF, consistent with USFWS guidelines (U.S. Navy 1998; Reed et al. 1985, Telfer et al. 1987), to avoid the attraction or disorientation of wildlife.
PMRF’s use of these structures provides an example for other private and government activities that use nighttime lighting on Kauai (personal communication, John Burger, PMRF Environmental Coordinator).

Furthermore, the onshore drilling and conduit installation would take place over nine weeks in spring and summer, prior to the Newell’s shearwater’s relocation from the island interior to coastal areas. As a result, there would be no effect on this species.

*Dark-Rumped Petrel*

The Proposed Action would not have any direct or indirect impacts to dark-rumped petrel nesting habitat, and the onshore drilling and construction would occur in spring and summer, before the dispersal season of this species. The use of downward-shielded lighting provides assurance that if individuals happened to be flying past the site at night, they would not be distracted or disoriented by lighting. Accordingly, there would be no effect on this species.

*Short-Tailed Albatross*

According to stipulations in the INRMP, if a short-tailed albatross is observed on PMRF, it will not be flushed or disturbed in any way and it will be reported to USFWS (U.S. Navy 2001). There is only one record of this species on PMRF, and the possibility that a short-tailed albatross would appear at the onshore construction site during the activity is remote. Nevertheless, the Proposed Action would include an environmental briefing to ensure that all personnel and contractors understand the requirements for protection of this species. Accordingly, the Proposed Action would have no effect on this species.

*Other ESA-Listed Wildlife*

The onshore project area does not contain wetlands or other suitable habitat for the Hawaiian coot (*Fulica alai*), common moorhen (*Gallinula chloropus*), black-necked stilt (*Himantopus mexicanus knudsenii*), or Hawaiian duck (*Anas wyvilliana*). The Proposed Action would have no effect on these species.

The onshore project area does not contain trees, shrubs, or other suitable roosting habitat for the Hawaiian hoary bat and the species has not been observed in this area (U.S. Navy 1998, 2001). The Proposed Action would have no effect on this species.

*Marine Mammals*

**Hawaiian Monk Seal**

The proposed drill site is a flat, grassy area located inland of the coastal berms and dunes and is not close enough to the shoreline to provide habitat for the Hawaiian monk seal (*Figures 2-2, 2-3, 3-1 and 3-2*). Hawaiian monk seals are likely to be present in the offshore waters where equipment installation and verification would take place. The stationary to slow-moving vessels involved in the installation would not pose a risk of collision to monk seals in the water given the species’ agility. Equipment verification would involve intermittent pulses by relatively low-level, mid-frequency acoustic sources, either on surface ships or on the ocean bottom, that are identical to existing range sources. These sources have been previously evaluated (U.S. Navy 1998, Mobley 2000, Jette et al. 2005, U.S. Navy 2006, NOAA 2006) and found unlikely to affect marine mammals based on their sound-source and frequency characteristics. Therefore, the Navy has determined that the Proposed Action would have no effect on the Hawaiian monk seal, and that there would be no reasonably foreseeable “take” of this species as defined in the MMPA.

**Whales**
Humpback whales most often occur within the 985-ft (300-m) depth contour of the Hawaiian Islands during winter months. Installation of the J-box, trunk cables, and four sensor cables will take place in spring through summer, largely avoiding the humpback whale breeding season. The Hawaiian Islands Humpback Whale National Marine Sanctuary includes a portion of the ocean north of Kauai, but not within the Barking Sands PMRF vicinity or in the BSURE coverage area.

Cable deployment vessels would move very slowly during cable installment activities (0 to 3 knots [0 to 5.6 km per hour]), and would not pose a collision threat to marine mammals expected to be present in the vicinity. The cables would be configured to follow seafloor contours and avoid potentially hazardous geologic features. The cables would be taut against the seafloor, without loose slack. Entanglement of marine species is not likely because the rigidity of the cable that is designed to lie extended on the sea floor vice coil easily. Once installed on the seabed, the new cable and communications instruments would be equivalent to other hard structures on the seabed, again posing no risk of adverse effect on marine mammals. Prior to 1955, several entanglements of large whales in submarine telecommunications cables were reported in the Pacific Ocean (Heezen 1957), but since the mid-1950s no whale entanglements have been documented, presumably due to advances in cable building and laying technology (Norman and Lopez 2002).

Equipment verification would involve intermittent pulses by relatively low-level, mid-frequency acoustic sources, from equipment mounted on surface ships or on the ocean bottom. These are identical to existing range sources that are part of routine operations. These sources have been previously evaluated (U.S. Navy 1998, Mobley 2000, Jette et al. 2005, U.S. Navy 2006, NOAA 2006) and found unlikely to affect marine mammals based on their sound-source and frequency characteristics. Therefore, the Navy has determined that the Proposed Action would have no effect on listed species of marine mammals, and result in no reasonably foreseeable ‘takes’ of marine mammals as defined in the MMPA.

ESA-Listed Sea Turtles

Foot and vehicle traffic associated with the BSURE refurbishment would be confined to the designated construction site and existing roadways, and would not encroach into the beach area or Nohili Ditch. Outdoor lighting associated with the proposed project would be shielded to prevent upward reflection and radiation as specified in the PMRF EIS (U.S. Navy 1998). With downward-directed lighting of a small construction site behind a berm, over 1/3 mile from the Nohili Ditch and separated from it visually by topography and an intervening stand of scrub vegetation, no effect is anticipated. John Burger, PMRF Environmental Coordinator confirms that the Green Sea Turtle haul-outs are almost exclusively at Nohili Ditch, and reports only one sighting on one day on the beach in front of the onshore construction area in the last 2.5 years. The beach in front of the area is not a nesting site. The Proposed Action would have no effect on sea turtles.

Essential Fish Habitat

In considering the potential impacts of a Proposed Action on EFH, all designated EFH must be considered. The designated EFH within the project area includes nearshore benthic habitat, pelagic habitat, and coral reef habitat. The Proposed Action is designed and configured to avoid sensitive nearshore habitat entirely by utilizing HDD installation under the seafloor. As described above, underwater construction would not adversely affect the coral reef ecosystem off PMRF. The installation would avoid impacting live coral wherever possible, and although relatively small patches or colonies of coral may not be avoidable, the J-box, hardware, and the cables would provide substrate for coral and other benthic organisms. Temporary and minor turbidity and sedimentation during installation would not
affect the ability of EFH to support healthy fish populations. The Proposed Action would not adversely impact coral reef habitat or other EFH components.

In the offshore water column EFH, the Proposed Action would have no effect and would entail temporary activity on the surface and in the water column during the installation. The activity would have no more than temporary and minimal impacts, and therefore would not adversely affect EFH.

Summarizing the above subsections, the proposed action would have no significant impact on biological resources.

**No Action Alternative**

Under the No Action Alternative, BSURE refurbishment would not occur. HDD would not occur and no cable array installation would be conducted. The current degraded state of BSURE is vulnerable to damage, failure, and lowered operational abilities. Under the No Action Alternative, random failures and accidental damage to the BSURE in-water hardware would continue to occur and would continue to diminish range tracking and communications capabilities. The loss of operational capability and the need for repairs would adversely impact ASW training. The No Action Alternative would have no significant impact on biological resources, but could increase the need for future repairs. Future repairs would have minor, insignificant effects on biological resources similar to those of the Proposed Action but affecting a smaller area.

**4.1.4 Cultural Resources**

**Proposed Action**

The onshore construction area is considered to have “low to medium sensitivity” for cultural resources (U.S. Navy 2005a). There are known traditional Hawaiian burials (Sites 05-1884, 05-1861) in the sand dunes between the drill site and the coastline (U.S. Navy 2005a), but the HDD route would be drilled deeper in the bedrock and would not affect these cultural resource sites. A World War II military dump site (05-2043) is located near the onshore project area, but outside the area of ground disturbance. The ICRM and designates this site as non-significant and ineligible for listing on the NRHP (U.S. Navy 2005a). The HDD site and cable trench routes have been altered by other projects. Previous shore landings included trenching the cable across the beach and through the berm to the cable vaults.

The Proposed Action is covered under the programmatic agreement between the Navy, Advisory Council on Historic Preservation, and Hawaii State Historic Preservation Officer (SHPO). The programmatic agreement is included in the ICRM for PMRF (U.S. Navy 2005a). The programmatic agreement and ICRM outlay management plans and stipulations for ground disturbing activities. Stipulations include personnel training as well as reporting requirements for previously unidentified historic properties that may be discovered during soil disturbance.

NUWC and PMRF would conduct a safety and environmental briefing for all contractor personnel. The briefing would explain existing policies regarding the sensitive biological and cultural resources at PMRF and illustrate the need to minimize disturbance to cultural sites and native plants, wildlife, and marine habitats. If any archaeological deposits are inadvertently discovered during the course of the Proposed Action, the standard operating procedures of the ICRM would be followed.

Appendix A contains the Navy’s finding (memo from V. Curtis) that the Proposed Action does not have the potential to affect cultural resources and that no further review or consultation is required. Therefore, the proposed action would have no significant impact on cultural resources.
No Action Alternative

Under the No Action Alternative, BSURE refurbishment would not occur. HDD would not occur and no cable array installation would be conducted. The current degraded state of BSURE is vulnerable to damage, failure, and lowered operational abilities. Under the No Action Alternative, random failures and accidental damage to the BSURE in-water hardware would continue to occur and would continue to diminish range tracking and communications capabilities. The loss of operational capability and the need for repairs would adversely impact ASW training. The No Action Alternative would have no significant impact on cultural resources, but could increase the need for future repairs. Future repairs would have effects on cultural resources similar to those of the Proposed Action.

4.1.5 Land and Water Use

Proposed Action

Onshore, the Proposed Action is limited to the historical work site at PMRF. The historical work site comprises existing cable vaults and conduits for connecting new undersea cables to the Cable Termination Building, Building 410. Building 410 is the location of the cable terminus and shore landing for all previous cable installations and repairs from 1967 to the present day. The water supply for the proposed action would be provided by an existing 2-inch municipal waterline, which provides up to 300 gallons per minute. A 1.5 million-gallon water storage tank is also available for use at the site.

There will be no increase in the coverage area or increase in training operations tempo associated with this action. The Proposed Action involves the placement of new cables and sensors within areas that currently contain the same types of equipment. The location for the Proposed Action is consistent with the historical work site at PMRF; therefore there will be no change in land use and no significant impact would occur.

There will be no change to public access to beaches. Access is not currently available at this site and the nearby areas allowing beach access will not be affected.

The Proposed Action will not cause traffic hazards or degradation of LOS (level of service) below "D" classification. Level of service “D” classification represents high-density traffic with restricted speed and convenience. Level “D” is generally recognized as the lowest acceptable flow of traffic. Construction traffic would transit to and from the site along existing access roads at PMRF Barking Sands. Vehicles would include cargo trucks, personal vehicles, forklifts, and earth-moving equipment. Construction vehicles would be present on the roadways for only a limited amount of time during the implementation of the project. The capacity of the roadways would not be exceeded and traffic would not be impaired; therefore, no significant impact would occur. There will be no change to the offshore water use in the area containing BSURE. Use is currently limited by the fact that it is a warning area, W-188 where military training exercises that are potentially hazardous to the public occur on a continuous basis. No additional limitations will be placed on this area; therefore no significant impacts on water use will occur.

The Hawaii Coastal Zone extends to three nautical miles from shore and includes the area where the J-box and connecting cables would be installed, but does not include the underwater tracking area of BSURE. Due to its location and the small areas of land and ocean bottom affected by the installation, the Proposed Action would have minimal or no (depending on the resource) effects on coastal resources, including recreational, scenic, economic, and natural resources, nor would it conflict with the enforceable policies defined by the Hawaii Coastal Zone Management Program (Hawaii CZM Program 2007). The Navy and State of Hawaii have recently formalized the *de minimis* list under Federal Consistency
Regulations [15CFR 930.34(3)(i)] for Navy activities that are mutually agreed to have insignificant effects on resources of the coastal zone, and which are thereby exempted from the need to submit a Consistency Determination or Negative Determination (Appendix A). The Navy’s and State’s representatives discussed the BSURE Refurbishment and agreed that the activity meets de minimis criteria, specifically number 3 for repair and maintenance of equipment associated with existing operations and activities (Appendix A; Chang 2008). Use of this de minimis category requires compliance with NHPA and NEPA requirements (Appendix A), which are being satisfied in conjunction with this Record of CATEX/OEA. The Navy has determined accordingly that the Proposed Action is consistent to the maximum extent practicable with the enforceable policies of the Hawaii Coastal Zone Management Program and is in compliance with the CZMA; no significant impacts would occur.

**No Action Alternative**

Under the No Action Alternative, BSURE refurbishment would not occur. HDD would not occur and no cable array installation would be conducted. The current degraded state of BSURE is vulnerable to damage, failure, and lowered operational abilities. Under the No Action Alternative, random failures and accidental damage to the BSURE in-water hardware would continue to occur and would continue to diminish range tracking and communications capabilities. The loss of operational capability and the need for repairs would adversely impact ASW training. The No Action Alternative would have no effect initially on land and water use, but could increase the need for future repairs. Future repairs would have effects on land and water use similar to those of the Proposed Action.

**4.1.6 Noise**

**Proposed Action**

Sound source levels from the HDD rig, the loudest piece of equipment at the onshore site, may be up to 104 dBA at the source, which would decline to approximately 74 dBA at a distance of 105 feet (32 m), near the edge of the site, assuming normal attenuation rates of 6 dBA per doubling of distance (USEPA 1971; Construction Engineering Research Laboratory [CERL] 1975; CSLC 2000; Jones and Evans 2000). Lower noise levels - 79-86 dB (dB and dBA are essentially equivalent here) within 10 feet (3 m) of the HDD rig, were measured at a recent drilling project on Kauai (Racette 2008). Using the larger value of 104 dBA at the source as a worst case, construction noise levels would be near ambient at the beach or inland edge of the site, based on the proximity of the airfield and the associated noise contours as described previously in section 3.1.6 and shown in Figure 3-3 (U.S. Engineering Field Activity Chesapeake 2006). As noted previously, missile launches generate substantially louder noise in the general area (section 3.1.6). There are no potentially sensitive residences or human activities in the immediate area that could be affected. Given sound attenuation to near ambient levels within a short distance of the site, construction noise would not have a significant on the human or natural environment at PMRF.

The surface and underwater activities in support of HDD, trunk cable, J-box, and array installation would last several days and would involve various sources of noise, including typical marine vessel engine and equipment noises at the surface, a brief grinding noise on the seabed at the drill exits, and the use of hand tools (hammers, drills, water jets) by divers to secure the equipment. These noise sources would be of relatively low intensity, localized and transient, and are unlikely to interfere with the activities or affect the distribution and abundance of fishes and marine wildlife in the vicinity. As such, no significant impact due to noise would occur.
Farther offshore, the Proposed Action entails transient engine and mechanical noises as the vessel moves through the water. The offshore area of BSURE is heavily used by Navy vessels and aircraft, as well as private and commercial vessels, and the proposed cable activities represent a small fraction normally occurring vessel traffic. Noise associated with vessel engines and deployment of the equipment would occur in the immediate vicinity of the vessel(s) and on the ocean bottom, but would dissipate rapidly with distance from the source and would not be expected to affect fish or marine wildlife abundance in the vicinity. As discussed in chapter 2, the pulsed sounds associated with equipment testing are equivalent in source level and frequency to sounds produced by existing range sources which are continuously in use for training.

Based on the above, installation and testing the equipment would not have a significant impact due to noise.

**No Action Alternative**

Under the No Action Alternative, BSURE refurbishment would not occur. HDD would not occur and no cable array installation would be conducted. The current degraded state of BSURE is vulnerable to damage, failure, and lowered operational functionality. Under the No Action Alternative, random failures and accidental damage to the BSURE in-water hardware would continue to occur and would continue to diminish range tracking and communications capabilities. Future repairs, if required, would have minor, insignificant impacts on the onshore and offshore noise environment, similar to those of the Proposed Action.

**4.2 AREA SUBJECT TO EO 12114: OPEN OCEAN (>12NM)**

**4.2.1 Geology**

**Proposed Action**

As discussed in section 4.1.1, impacts to geological resources in the offshore installation area would be limited to the temporary disruption of sediment as the cable arrays fall to the seabed. Cables would be laid perpendicular, rather than parallel to, steep offshore slopes along the cable route. Perpendicular placement is more stable and reduces the risks of damage from underwater landslides or differential slippage of cable sections down side slopes. Array cables and nodes in BSURE would be placed within the existing tracking area. The total extent of temporary disturbance, assuming an average 12-inch (30 cm) wide area of disruption, would be roughly 17.4 acres (~7.05 ha). As discussed in section 3.1, the affected areas are predominantly unconsolidated sediments of varying composition; no unique features would be affected. The cables and instruments would constitute approximately 2 acres (0.8 ha) of new substrate. Because of the localized, temporary nature of the impact to substrates which occur over vast areas of the ocean bottom, there would be no significant harm to the marine environment.

Once cables and other materials are in place, they are not expected to move. The cables consist of metallic and synthetic, essentially inert materials (glass fibers, plastic (polyethylene), copper, steel, waterproof nylon yarn). Based on observations of underwater cables off Kauai (Office of Naval Research 2001) and elsewhere (NAVFAC Atlantic Division 2004, MBARI 2003, Ocean City Reef Foundation 2004, Dollar and Brock 2006), the replacement cables, like the existing cables, will soon also be covered with marine growth or buried by sand, and would not break down for a very long period of time. Ultimately, as these components disintegrate, decompose, or corrode, the constituent elements would be dispersed into surrounding media, with no significant harm to sediment or water quality.
No Action Alternative

Under the No Action Alternative, BSURE refurbishment would not occur. No array installation would be conducted. Continued age-related random failures and accidental damage to the 27 year old BSURE in-water hardware would continue to occur. Range tracking and communications capabilities would degrade or be completely stopped. The No Action alternative would lead to an increasingly likely event of sudden, complete failure. If this occurred, Mid-Pacific Fleet Submarine Training would be severely curtailed and additional repair actions would be needed. Future repairs, if required, would have minor, insignificant impacts on bottom substrates, similar to those of the Proposed Action but affecting a smaller area.

4.2.2 Water Quality

Proposed Action

As discussed in section 4.1.2, small-scale increases in turbidity would occur due to installation of the cables and nodes on the seafloor. Turbidity would be minor and temporary throughout the refurbishment project and would occur at great depths, with the shallowest node being located approximately 6,000 ft deep. Sediments would rapidly disperse and/or settle back to the seabed. Coarse sediments (sand or larger) would resettle within seconds in the immediate area, whereas fines (silt to clay) would tend to drift and remain in suspension for minutes to hours, depending on particle sizes and bottom currents (U.S. Minerals Management Service 1999). There would be no permanent or significant effect on marine water quality due to suspended sediments. The outer layers of submarine cables are insoluble and readily become encrusted with marine organisms and are not expected to break down for decades. Inner metallic components are sealed from the surrounding media. Any by-products of corrosion or dissolution of cable components in seawater would be rapidly dispersed and diluted in the water column and as such would result in no significant harm to water quality.

The only hazardous substances that would be used in the proposed project are lubricants and fuel contained in marine vessels and equipment. PMRF activities follow the Navy and federal requirements for the management of hazardous materials and hazardous waste. Vessels engaged in installation would carry sorbent booms (floating barriers to contain and absorb oil on the surface of the water) and pads for cleanup use in the unlikely event of a fuel spill, and would adhere to all Navy (OPNAVINST 5090.1C, 22-9) and Coast Guard (Clean Water Act, section 311) requirements regarding the containment, cleanup, and reporting of spills. No significant harm to marine water quality would occur.

No Action Alternative

Under the No Action Alternative, BSURE refurbishment would not occur. No cable array installation would be conducted. The current degraded state of BSURE is vulnerable to damage, failure, and lowered operational functionality. Under the No Action Alternative, random failures and accidental damage to the BSURE in-water hardware would continue to occur and would continue to diminish range tracking and communications capabilities. The loss of operational capability and the need for repairs would adversely impact ASW training. Future repairs, if required, would have minor, insignificant impacts on water quality, similar to those of the Proposed Action although affecting a smaller area.
4.2.3 Biological Resources

Proposed Action

Marine Habitats

Offshore marine habitats would be temporarily affected by the deployment of cables and nodes, but the impacts of BSURE refurbishment would not impair the potential of the habitat to support marine organisms. Deployment of the cables may temporarily increase turbidity at the area of impact on the seafloor, but the impact would be insignificant. The substrate is predominantly unconsolidated sediments and consolidated material which cover the volcanic bedrock. Sediments on the bathyal slope and abyssal plain may experience temporary turbidity when the cable is installed, however sediments would rapidly settle and resume a pre-disturbed state. As discussed above, there would be a temporary disruption of the seabed, occurring linearly as each of the four array cables is laid over the course of approximately 18 days. The total area temporarily disturbed would amount to roughly 17.4 acres (7.05 ha) on the seabed, whereas the amount of new substrate provided by the instruments would be 2 acres (0.8 ha). The cable will be laid taut against the seafloor, minimizing cable slack and the possibility of movement. The instruments would over time be either buried, or covered with marine growth. Buried cables in soft substrate can also provide a substrate for attachment by sessile organisms, such as anemones (MBARI 2003). The rate at which this process would occur in the deep waters of BSURE is unknown, but in any case, the result would be no effect on marine habitats and no significant harm to the environment.

Fish and Wildlife

Disturbance of fish and invertebrates in the immediate vicinity of the cable arrays and deployment vessels would be temporary and minor. Vessel activity and engine noise at the surface, and sediment disturbance on the bottom, may temporarily cause marine animals to move away from these areas during deployment. A relatively small area - a linear strip up to roughly 12 inches (30 cm) wide - of the benthic invertebrate community would be temporarily impacted where the cables fall on the sea floor. After installation, the cables and nodes would provide anchoring substrate for benthic organisms. The rate at which this would occur, and the specific organisms that would colonize cables in BSURE are unknown (see next paragraph).

The process of “biofouling” – the attachment and growth of organisms on artificial substrates submerged in seawater (Davis and Williamson 1995) – on submarine cables has not been studied in detail. However, it is reasonable to apply the same successional processes leading to the development of fouling communities on other types of artificial substrates to the surfaces of submarine cables. Following colonization by microorganisms, the initial development of the macrofouling (encrusting plants or animals visible to the eye) community is dependent on the dispersal of spores or larvae that will colonize the substrate, which usually is tied to the seasonal reproduction of the constituent organisms. Hence, the initial development of a biofouling community is expected to occur within the year following submersion of the substrate. Subsequent growth of the organisms and further succession are dependent on local factors such as light, temperature, nutrient availability, predation, disturbance, and recolonization (Connell and Slatyer 1977). Field experiments in which different types of artificial substrates have been set out under the same environmental conditions indicate that similar communities tend to develop on rubber, concrete, steel, or rock substrates, and that any of these types of materials can be used to increase the abundance and diversity of organisms by increasing the availability of hard substrate and surface heterogeneity (Figley 2003). Other than the unique communities associated with hydrothermal vents, abyssal epifauna (inhabitants of hard substrates) are poorly known. The types of organisms that would
colonize the BSURE instruments in deep-water would probably be similar to those found on other patchily distributed hard substrates in very deep water and include but are not limited to encrusting foraminifera, colonial anemones, hydroids, tunicates, tube-dwelling worms, and bryozoans (Beaulieu 2001). The possibility that deep sea corals would occur on the instruments is speculative but cannot be eliminated. No effect on corals is anticipated otherwise.

Pelagic organisms in BSURE would be exposed to vessel traffic during cable deployment, but the vessels represent a small and temporary increase over existing levels of utilization in the range. Cable deployment vessels are slow-moving and do not pose a risk to marine wildlife populations. No significant harm to marine wildlife would occur due to the Proposed Action.

**Special-Status Species**

**ESA-Listed Seabirds**

**Newell’s Shearwater.** The surface waters of BSURE are utilized for existing Navy operations, recreational boating, commercial fishing, and transport vessels. Additional vessels used in the proposed BSURE refurbishment represent only a marginal increase in existing vessel traffic. Offshore vessels would move slowly during cable deployment (0 to 3 knots [0 to 5.6 km per hour]) and would not pose a collision threat to foraging Newell’s shearwaters. There would be no effect on this species.

**Dark-Rumped Petrel.** The surface waters of BSURE are utilized for existing Navy operations, recreational boating, and commercial fishing, and transport vessels. Additional vessels used in the proposed BSURE refurbishment represent only a marginal increase in existing vessel traffic. Offshore vessels would move slowly during cable deployment (0 to 3 knots [0 to 5.6 km per hour]) and would not pose a collision threat to foraging dark-rumped petrels. There would be no effect on this species.

**Short-Tailed Albatross.** The probability of short-tailed albatross occurring in the project area is remote; only one individual has been identified at PMRF. Offshore vessels would move slowly during cable deployment (0 to 3 knots [0 to 5.6 km per hour]) and would not pose a collision threat to foraging or migrating short-tailed albatrosses. If a short-tailed albatross is observed on PMRF, it will not be flushed or disturbed in any way and it will be reported to USFWS, following guidance in the INRMP (U.S. Navy 2001). There would be no effect on this species.

**Marine Mammals**

Installation of the offshore cable arrays will take place in spring through summer, largely avoiding the humpback whale breeding season. Cable deployment vessels would move very slowly during cable installment activities (0 to 3 knots [0 to 5.6 km per hour]), and would not pose a collision threat to marine mammals expected to be present in the vicinity. There are no documented incidents of marine mammal entanglement in a submarine cable during the past 50 years (Norman and Lopez 2002). The cables would be configured to follow seafloor contours and avoid potentially hazardous geologic features. The cables would be taut against the seafloor, without loose slack. Entanglement of marine species is not likely because the rigidity of the cable that is designed to lie extended on the sea floor vice coil easily. Once installed on the seabed, the new cable and communications instruments would be equivalent to other hard structures on the seabed, again posing no risk of adverse effect on marine mammals. The likelihood of any marine mammals being in the immediate vicinity of the cables and hydrophones as they are deployed and tested on the seafloor in depths of 5,400 to 15,000 ft (1,650 to 4,500 m) is extremely small. The project vessels would abide by all appropriate Navy regulations regarding marine mammal sighting and reporting (OPNAVINST 5090.1C, 22-12).
During installation, the new instruments would be tested within the same acoustic parameters that the range continually operates in. Hence, there would be no change to the acoustic environment. Equipment verification would involve intermittent pulses by relatively low-level, mid-frequency acoustic sources, from equipment mounted on surface ships or on the ocean bottom. These are identical to existing range sources that are part of routine operations. These sources have been previously evaluated (U.S. Navy 1998, Mobley 2000, Jette et al. 2005, U.S. Navy 2006, NOAA 2006) and found unlikely to affect marine mammals based on their sound-source and frequency characteristics. Therefore, the Navy has determined that the Proposed Action would have no effect on listed species of marine mammals, and result in no reasonably foreseeable ‘takes’ of marine mammals as defined in the MMPA.

Federally listed threatened or endangered marine mammals that may occur in the project vicinity would also range widely across the area. As noted above, the slow pace of the installation activity and the manner of its deployment indicate that the vessels and equipment do not pose a risk of collision or entanglement to individuals. The Navy has determined there would be no reasonably foreseeable ‘takes’ of marine mammals as defined in the Marine Mammals Protection Act.

**ESA-Listed Sea Turtles**

Disturbance of the water column due to the proposed project would amount to a marginal and temporary increase in vessel traffic in the BSURE coverage area. Vessels would travel slowly (0 to 3 knots [0 to 5.6 km per hour]) and would not pose a collision risk to sea turtles. Cable arrays would be taut, without loose slack, eliminating the risk of entanglement. For these reasons, sea turtles, if present in the vicinity of refurbishment activities, would not be affected. There would be no effect on, nor significant harm to, ESA-listed sea turtle species.

**Essential Fish Habitat**

The offshore water column habitat where the Proposed Action would occur is EFH. Under the provisions of the MSFCMA, as reauthorized by the Sustainable Fisheries Act Amendments, federal agencies must consult with NMFS prior to undertaking any actions that may adversely affect EFH. Federal agencies retain the discretion to determine what actions fall within the definition of “adverse affect.” Temporary or minimal impacts, as defined in Navy (OPNAVINST 5090.1C, 24-6f) and NMFS (50 CFR Part 600) regulations and below, are not considered to “adversely affect” EFH. “Temporary impacts” are those that are limited in duration and that allow the particular environment to recover without measurable impact. “Minimal impacts” are those that may result in relatively small changes in the affected environment and insignificant changes in ecological functions.

Relevant to EFH in the offshore area of installation (see Table 3-3), the Proposed Action would have no effect on EFH benthic habitats, and would entail temporary activity on the surface and in the water column during the installation. The activity clearly would have no more than temporary and minimal impacts, and therefore would have no adverse effect on EFH. Therefore, no consultation is required. No significant harm to EFH would occur.

Summarizing the above subsections, the proposed action would not result in significant harm to biological resources in the open ocean environment.

**No Action Alternative**

Under the No Action Alternative, BSURE refurbishment would not occur. No cable array installation would be conducted. The current degraded state of BSURE is vulnerable to damage, failure, and lowered operational abilities. Under the No Action Alternative, random failures and accidental damage to the
BSURE in-water hardware would continue to occur and would continue to diminish range tracking and communications capabilities. The loss of operational capability and the need for repairs would adversely impact ASW training. The No Action Alternative would have no effect initially on biological resources, but could increase the need for future repairs. Future repairs would have minor, insignificant effects on biological resources similar to those of the Proposed Action but affecting a smaller area.

4.2.4 Noise

Proposed Action

The potential consequences to the noise environment further than 12 nm from the shoreline is similar to the open-ocean consequences described in 4.2.4. Cable deployment vessels would generate a moderate level of noise in the immediate vicinity, but the sound would not be in excess of normal vessel traffic occurring over the area of BSURE. The sound source levels are relatively low and not problematic. Furthermore, the cable deployment would occur in the open ocean, well away from any sensitive noise receptors or incompatible land/water uses. The proposed action would not result in significant harm to the noise environment.

No Action Alternative

Under the No Action Alternative, BSURE refurbishment would not occur. HDD would not occur and no cable array installation would be conducted. The current degraded state of BSURE is vulnerable to damage, failure, and lowered operational functionality. Under the No Action Alternative, random failures and accidental damage to the BSURE in-water hardware would continue to occur and would continue to diminish range tracking and communications capabilities. Future repairs, if required, would have minor, insignificant impacts on the offshore environment, similar to those of the Proposed Action although affecting a smaller area.
CHAPTER 5
OTHER CONSIDERATIONS

This chapter addresses other considerations required by NEPA, including cumulative impacts; possible conflicts with the other plans, policies, and controls; irreversible and irreplaceable commitment of resources; short-term vs. long-term productivity; environmental justice impacts; and protection of children from environmental health risks.

5.1 CUMULATIVE IMPACTS

CEQ regulations implementing the procedural provisions of NEPA define cumulative impacts as:

“The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR § 1508.7).

In order to analyze cumulative impacts, a cumulative impacts region must be identified for which impacts of the Proposed Action and other past, present, and reasonably foreseeable actions would be cumulatively recorded or experienced. The relevant cumulative impacts region for this analysis is the onshore and offshore areas of the BSURE underwater tracking range located within Pacific Missile Range Facility (PMRF). Due to the location and temporary nature of installation activities, there are no potential cumulative impacts due to activities conducted elsewhere on or offshore of the PMRF or elsewhere in the region. There would be no additional operations or change in the usage of BSURE as a result of the Proposed Action.

5.1.1 Other Relevant Actions

The PMRF is the world’s largest military test range capable of supporting subsurface, surface, air, and space operations, and as such is the site of ongoing military operations such as training, tactics development, and evaluation of air, surface, and subsurface weapons systems for the Navy, other Department of Defense agencies, foreign military forces, and private industry. In addition to military activities, there are ongoing commercial and recreational activities within the offshore portion of the PMRF range, including commercial and recreational fishing and vessel traffic, whale watching, and scientific research.

5.1.2 Cumulative Impacts of the Proposed Action

This section addresses the cumulative impacts of the Proposed Action in combination with the relevant actions described above.

Geology and Soils

Implementation of the Proposed Action in conjunction with the other relevant actions would not result in significant impacts to geology and soils within the region of influence. The impacts on geology are minor and mostly consist of limited temporal and spatial disturbances to underwater sediments or localized soil disturbance in previously disturbed areas. The temporary, surficial disturbance of the onshore construction site associated with the proposed action would not have a significant cumulative impact.

Water Quality

Implementation of the Proposed Action in conjunction with the other relevant actions would not result in significant impacts to water quality within the region of influence. When evaluated individually or
cumulatively, these projects have either no impact or only short-term impacts on water quality. Water quality impacts associated with implementation of the Proposed Action and No-Action Alternative are minor, localized and temporary in nature and would not reach a level of significance even in conjunction with the impacts of the other actions considered in a regional context.

**Biological Resources**

Implementation of the Proposed Action would not significantly impact terrestrial or marine biological resources. As noted above, there would be no significant cumulative impacts on geology or water quality that might otherwise indirectly affect biological resources. Project-related impacts on biological resources both onshore and offshore would be localized and temporary, and would not contribute to any cumulative impacts.

**Cultural Resources**

Implementation of the Proposed Action would not adversely impact cultural resources. The Proposed Action would not result in disturbance of known archaeological sites. No submerged or onshore cultural resources are known to exist in the project area, nor would any cultural resources be likely to be affected by proposed activities. Therefore, the Proposed Action, in conjunction with other activities within the PMRF, would not result in significant cumulative impacts to cultural resources.

**Land and Water Use**

Implementation of the Proposed Action would not result in significant or substantial land or water use impacts. The siting of onshore activities, in an area where no land use changes would be necessary, effectively minimizes potential conflicts with other uses and would not have an adverse cumulative impact. Overall, recreational resources would continue to be protected and no changes to shoreline access would occur. The offshore activities associated with cable installation would be localized and temporary in nature. Therefore, no significant cumulative impacts due to the onshore or offshore installation would occur.

**Noise**

Implementation of the Proposed Action would not result in significant noise impacts or generate substantial amounts of noise. Noise due to the Proposed Action would occur from relative localized and/or transient sources that are not likely to impact human receptors or affect fish and wildlife. As such, no additive or interactive effects with other noise sources would be anticipated. Therefore, no significant cumulative impacts due to noise associated with the onshore or offshore installation would occur.

5.2 **POSSIBLE CONFLICTS BETWEEN THE ACTION AND THE OBJECTIVES OF FEDERAL, REGIONAL, STATE, AND LOCAL PLANS, POLICIES, AND CONTROLS**

Implementation of the Proposed Action would be consistent with federal, regional, state and local plans, policies, and controls to the extent required by federal law and regulation. No potential conflicts have been identified. Following is a summary of the Proposed Action’s compliance with key environmental and regulatory requirements, referencing the relevant sections of this document.

- *Endangered Species Act (16 U.S.C. § 1531).* The Navy has determined that the Proposed Action would have no effect on federally listed species (sections 4.1.3 and 4.2.3), indicating that further action/consultation is not required.
- **Marine Mammal Protection Act (16 CFR § 1431 et seq.).** The Navy has determined that the Proposed Action would have no effect and that there would be no reasonably foreseeable takes of marine mammals as defined by the MMPA (section 4.1.3 and 4.2.3), indicating that no further action is required.

- **Clean Water Act Section 401/402 (§§ 4101-402, 33 U.S.C. § 1251 et seq.).** As required by Section 402, the project would obtain coverage for storm water discharge under the State’s NPDES General Permit Authorizing Discharges of Storm Water Associated with Construction Activities (section 2.5). The Proposed Action is not anticipated to result in a discharge of dredged or fill material.

- **Section 10 Rivers and Harbors Act (33 U.S.C. § 401 et seq.).** A Section 10 Rivers and Harbors Act permit will be obtained for the installation of equipment on the seabed (section 2.5). The permit would be applied for following completion of NEPA requirements and obtained prior to installation.

- **Clean Air Act (42 U.S.C. § 7401 et seq.).** The Proposed Action would result in temporary emissions that do not require further analysis or action (section 1.3).

- **National Historic Preservation Act (16 U.S.C. 470 et seq.).** Based on the lack of effect on cultural resources and adherence to the PMRF ICRMP, the Proposed Action is in compliance (section 4.1.4).

- **Coastal Zone Management Act (CZMA) (16 CFR § 1451, et seq.).** The Navy, with concurrence from the state, has determined that the Proposed Action meets *de minimis* criteria established by the Navy and State of Hawaii under Federal Consistency Regulations [15 CFR 930.34(3)(i)], and as such, would have minimal and insignificant effects on coastal resources within the state coastal zone. The action would be consistent to the maximum extent practicable with the enforceable policies of the Hawaii Coastal Zone Management Program and is therefore in compliance with the CZMA (section 4.1.5).

- **Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.).** The Navy has determined that the Proposed Action would not adversely affect EFH and is thereby in compliance (sections 4.1.3 and 4.2.3).

- **Executive Order 13089 (Coral Reef Protection).** Relatively small areas of limestone substrate and patches of live coral could be damaged during the installation, corals are expected to grow on the equipment once it is installed, and there would be no adverse effect on the coral reef ecosystem. The Navy has designed the project and incorporated procedures to minimize the potential for incidental damage to corals in the offshore project area. The proposed action complies with the Executive Order (section 4.1.3).

### 5.3 Irreversible or Irretrievable Commitment of Resources

Resources that are irreversibly or irretrievably committed to a project are those that are used on a long-term or permanent basis. This includes the use of non-renewable resources such as metal and fuel, and other natural or cultural resources. These resources are irretrievable in that they would be used for this project when they could have been used for other purposes. Human labor is also considered an irretrievable resource. Another impact that falls under this category is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.
The Proposed Action would not result in a significant irreversible or irretrievable commitment of resources. Implementation of the Proposed Action would require the consumption of limited amounts of materials associated with the installation of underwater cables. In addition, the use of installation machinery at the locations would result in the consumption of additional fuel, oil, and lubricants. However, the installation activities would be short-term and minor. Therefore, fossil fuel usage associated with installation machinery would be minimal. Human labor would be short-term and minimal as well. There would be no unavoidable destruction of natural resources.

5.4 RELATIONSHIP BETWEEN SHORT-TERM ENVIRONMENTAL IMPACTS AND LONG-TERM PRODUCTIVITY

NEPA requires an analysis of the relationship between a project’s short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing a single development option reduces future flexibility in pursuing other options, or that giving over a parcel of land or other resource to a certain use often eliminates the possibility of other uses being performed at that site.

The Proposed Action would dedicate a parcel of underwater land and a small amount of other resources to a particular use for the life of the project. However, these impacts are considered negligible, as the facilities and geographic areas associated with the Proposed Action are designated for and have historically accommodated the types of uses proposed. Upon the completion of the project no new land uses would be introduced or excluded. Therefore, the Proposed Action would not result in any impacts that would reduce environmental productivity or permanently narrow the range of beneficial uses of the environment.

5.5 ENVIRONMENTAL JUSTICE IMPACTS

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations, was issued to focus attention of federal agencies on human health and environmental conditions in minority and low-income communities to ensure that disproportionately high and adverse human health or environmental effects on these communities are identified and addressed.

The Proposed Action would occur within the boundaries of the PMRF; no change in personnel levels would occur; no impacts to schools, children, or minority populations would occur. No permanent population centers, low-income communities, or minority communities exist at the proposed project location. Therefore, no communities would be disproportionately susceptible to adverse socioeconomic or environmental impacts.

5.6 PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS

EO 13045, Protection of Children from Environmental Health Risks and Safety Risks, states that each federal agency shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. Environmental health and safety risks include risks to health or to safety that are attributable to products or substances that the child is likely to come into contact with or to ingest. This EO also focuses primarily on the noise environment around schools.

There are no schools, parks, or other areas where children would congregate within the vicinity of the Proposed Action. In addition, the Proposed Action would not result in the creation of hazardous
substances or contamination that would potentially affect children. Therefore, implementation of the Proposed Action or alternatives would not result in significant safety risks to children.
CHAPTER 6
CONCLUSIONS

6.1 NEPA CONCLUSION

After a thorough review of the potential impacts associated with the Proposed Action, it is determined that the proposed refurbishment activities onshore and within and including 12 nm of the coast would not have a significant impact on the human environment, nor would they trigger any of the extraordinary circumstances which, per SECNAVINST 5090.6A, Enclosure (1) paragraph 5.e, would preclude the use of a CATEX. These circumstances and an explanation of why they do not apply are as follows.

(1) Would adversely affect public health or safety. As described in Chapters 1 and 2, the Proposed Action poses no risks to public health or safety. The action would be similar to activities that regularly occur on PMRF and in the offshore waters, and do not involve the generation of hazardous materials or circumstances.

(2) Involves effects on the human environment that are highly uncertain, involve unique or unknown risks, or which are scientifically controversial. The installation activities involve well-established procedures for the installation of underwater communications equipment. Minor disturbance of the land and seabed would occur as the instruments are installed. Over time, the instruments become encrusted with marine life and provide a structural habitat. These types of projects have been conducted in Hawaii and throughout the world and are not scientifically controversial.

(3) Establishes precedents or makes decisions in principle for future actions that have the potential for significant impacts. The Proposed Action does not establish precedents or make decisions regarding BSURE. The action would proactively avoid the need for repairs and the disruption of Navy training, and it would sustain the training capability of the range. Operational use of BSURE has been addressed previously (U.S. Navy 1998) and is currently under consideration in the Hawaii Range Complex EIS.

(4) Threatens a violation of Federal, State, or local environmental laws applicable to the DoN [Department of the Navy]. Compliance with applicable laws is summarized in Chapter 5, section 5.2. The Proposed Action would comply with all applicable Federal, state, and local laws.

(5) Involves an action that, as determined in coordination with the appropriate resource agency, may: (a) Have an adverse effect on Federally-listed endangered/threatened species or marine mammals. As discussed in Sections 4.1.3 and 4.2.3, the Proposed Action would not effect on federally listed species or marine mammals.

(b) Have an adverse effect on coral reefs or on Federally-designated wilderness areas, wildlife refuges, marine sanctuaries, or parklands. As discussed in Section 4.1.3, the Proposed Action would not have an adverse effect on coral reef (EFH). The action area does not overlap any wilderness areas, refuges, sanctuaries, or parklands.

(c) Adversely affect the size, function or biological value of wetlands and is not covered by a nationwide or regional permit. No wetlands are present in the area of the Proposed Action.

(d) Have an adverse effect on archaeological resources or resources (including but not limited to ships, aircraft, vessels and equipment) listed or determined eligible for listing on the National
Register of Historic Places. As discussed in Section 4.1.4, there would be no adverse effects on archaeological or historic resources.

(e) Result in an uncontrolled or unpermitted release of hazardous substances, or require a conformity determination under the standards of the Clean Air Act General Conformity Rule. As described in Chapter 1, the Proposed Action does not require a conformity determination and would not result in an uncontrolled or unpermitted release of a hazardous substance.

Categorical Exclusion (CATEX), (34), under SECNAVINST 5090.6A, Enclosure (1) paragraph 5, e is applicable to this Proposed Action and is stated as follows:

(34) “New construction that is similar to existing land use and, when completed, the use or operation of which complies with existing regulatory requirements (e.g., a building within a cantonment area with associated discharges/runoff within existing handling capacities).”

Approved By: ________________________________  _________________
D. J. LONG  Date
CAPT. USN
PMA-205

6.2 EO 12114 CONCLUSION

Based upon this OEA, in accordance with EO 12114, it is determined that the Proposed Action to refurbish BSURE would have only minimal and temporary impacts on environmental resources beyond 12 nm from shore. The Proposed Action includes procedures that protect the environment, and requires no additional mitigation measures. No Significant Harm will occur to the environment.

Approved By: ________________________________  _________________
STEFFANIE B. EASTER  Date
ASSISTANT COMMANDER FOR ACQUISITION (AIR-1.0)
CHAPTER 7

REFERENCES


Chang, Connie. 2008. NAVFAC Pacific Division. Email communications to D. Goodman (NFESC) and M. Dungan (TEC Inc.), 24 January and 31 January.


Racette, R. 2008. Naval Undersea Warfare Center, Newport, RI. Email communication to M. Dungan (TEC), 11 March.


USFWS. 2003. Endangered and Threatened Wildlife and Plants; Final Designation or Nondesignation of Critical Habitat for 95 Plant Species from the Islands of Kauai and Niihau, HI; Final Rule. Federal Register 68 (39): 9115-9479. 27 February.


CHAPTER 8
PREPARERS

PROJECT OVERSIGHT—BSURE INTEGRATED PROJECT TEAM (IPT)

IPT Members
Michael Dick (IPT Co-Chair), Pacific Missile Range Facility
Dan Goodman (IPT Co-Chair), Naval Facilities Engineering Service Center
Doris Carvalho, Naval Undersea Warfare Center*
Michael Dungan, TEC Inc.
LCDR Robert Tetreault, Naval Air Systems Command
Becky Hommon, Navy Region Hawaii
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Edd Joy, KAYA
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Russell Racette (Engineering Design and Installation), Naval Undersea Warfare Center*
Scott Sysum, Naval Air Systems Command

*Primary authors of project description

DOCUMENT PREPARATION

This report was prepared by TEC Inc. under the direction of the BSURE IPT. Members of the TEC professional staff are listed below:

Project Management
Michael Dungan,
Ph.D., Ecology & Evolutionary Biology

Quality Assurance
Peer Amble,
B.A., Geography

GIS & Graphic Design
Deirdre Stites,
A.A., Geology

Technical Analysts
George Krasnick,
M.S., Biological Oceanography

Andrew Raaf,
M.S., Environmental Science and Management

Emily Althoen,
M.S., Environmental Science and Management

Becky Kaczur,
B.S., Natural Resources Conservation and Management
APPENDIX A:
CORRESPONDENCE
MEMORANDUM TO FILE

From: NAVFAC Pacific (EV2)

Subj: BSURE REFURBISHMENT PROJECT AT PACIFIC MISSLE RANGE FACILITY, KOKE’E, KAUA’I, HAWAI’I

Ref: (a) 2005 Final: Integrated Cultural Resources Management Plan (ICRMP) for the Pacific Missile Range Facility, Island of Kaua’i, State of Hawai’i


Encl: (1) Project Layout
(2) Project Location

This project involves subsurface drilling. The configuration of the drill rig, mud system, and support equipment will be done in such a way as to comply with existing and temporary rights-of-way. The work area will require some special preparations including a small pit approximately 3 x 2 x 1 meters filled with concrete. The concrete pad will be used as a dead man, anchoring the drill rig while drilling to ensure the stability of the equipment with the forces required during the drilling procedure. Enclosure 1 shows the layout of a typical HDD site, which would be located within the onshore construction site. A small sump pit will be excavated at the bore entry, this sump pit allows for the recovery of the drilling fluid coming from the borehole back to the surface. The fluid is picked up by a sump pump and transferred to the solids control unit where the solids contained in the drilling fluid are mechanically separated allowing the mud to be re-circulated down hole and used again. Most of the erosion control will be installed after all equipment is in place so any necessary movement during the set up process will not be impeded.

Reference (a) and Enclosure 2 identifies the Area of Potential Effect (APE) as a low sensitivity area for encountering archaeological sites with no known historic sites within the APE at the drill entrance and based on depth of excavation. Therefore, according to Stipulation IX.A.1 of Reference (b), no further review is required since the undertaking does not have the potential to cause effects on listed, contributing, or eligible properties. This memorandum is to be retained as administrative record of this finding.

Valerie N. Curtis

Copy:
CNRH N45 (Randy Miyashiro)
NAVFAC Hawaii EV (James Furuhashi)
Enclosure 1. Example of Project Layout

Enclosure 2. Project Location.
Ms. Laura Thielen, Director  
Office of Planning  
Department of Business, Economic  
Development and Tourism  
P. O. Box 2359  
Honolulu HI 96804

Dear Ms. Thielen:

SUBJECT: REQUEST FOR CONCURRENCE WITH DEPARTMENT OF THE NAVY DE MINIMIS ACTIVITIES UNDER THE COASTAL ZONE MANAGEMENT ACT (CZMA)

This letter is to request your concurrence with the attached list of Navy de minimis activities under CZMA for the areas in the Pearl Harbor Naval Complex, Naval Magazine Lualualei, and Naval Communications and Telecommunications Area Master Station Pacific on Oahu, as well as Pacific Missile Range Facility on Kauai and all associated installations/facilities/equipment located outside of these Navy properties.

The Navy has determined that the listed Proposed Actions have insignificant direct or indirect (cumulative and secondary) coastal effects and should therefore be categorized as de minimis in accordance with the Department of Commerce, National Oceanic and Atmospheric Administration, CZMA Federal Consistency Regulations 15 CFR Part 930.33(3). With the corresponding mitigation and conditions applied, these actions would be exempt from a negative determination or a consistency determination from the State of Hawaii.

Should you have any questions, please contact Mr. Brett Chambers at 472-1446, by facsimile transmission at 474-5419, or by email at brett.chambers@navy.mil.

Sincerely,

C. K. Yokota  
Director  
Regional Environmental Department  
By direction of the Commander

Enclosure: 1. Navy De Minimis Activities Under CZMA
### Navy De Minimis Activities Under CZMA

*covering areas in Pearl Harbor Naval Complex, Naval Magazine Lualualei, Naval Communications and Telecommunications Area Master Station (NCTAMS) Pacific, Pacific Missile Range Facility (PMRF) and all associated installations/facilities/equipment located outside of these Navy properties.*

<table>
<thead>
<tr>
<th>No.</th>
<th>Proposed Action</th>
<th>Description</th>
<th>Mitigation / Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>New Construction</td>
<td>Construction of new facilities and structures wholly within Navy controlled property that is similar to present use and, when completed, the use or operation of which complies with existing regulatory requirements.</td>
<td>1, 3, 6, 8, 9, 10, 11, 13, 14</td>
</tr>
<tr>
<td>2</td>
<td>Utility Line Activities</td>
<td>Acquisition, installation, operation, construction, maintenance, or repair of utility and communication systems that use rights of way, easements, distribution systems, and/or facilities on Navy controlled property. This also includes the associated excavation, backfill, or bedding for the utility lines, provided there is no change in preconstruction contours.</td>
<td>1, 10, 11, 12, 14</td>
</tr>
<tr>
<td>3</td>
<td>Repair and Maintenance</td>
<td>Routine repair and maintenance of buildings, ancillary facilities, piers, wharves, dry docks, vessels, and equipment associated with existing operations and activities.</td>
<td>12, 14</td>
</tr>
<tr>
<td>4</td>
<td>Aids to Navigation</td>
<td>Includes buoys, beacons, signs, etc. placed within Navy controlled areas and navigable waters as guides to mark safe water.</td>
<td>2, 5, 14</td>
</tr>
<tr>
<td>5</td>
<td>Structures in Fleeting and Anchorage Areas</td>
<td>The installation of structures, buoys, floats and other devices placed within anchorage or fleeting areas to facilitate moorage of vessels on military installations.</td>
<td>2, 5, 14</td>
</tr>
<tr>
<td>6</td>
<td>Oil Spill and Hazardous Waste Cleanup</td>
<td>Activities required for the containment, stabilization, removal and cleanup of oil and hazardous or toxic waste materials on Navy controlled property.</td>
<td>1, 8, 14</td>
</tr>
<tr>
<td>7</td>
<td>Maintenance Dredging</td>
<td>Excavation and removal of accumulated sediment for maintenance to previously authorized depths.</td>
<td>2, 3, 4, 5, 7, 8, 9, 13, 14</td>
</tr>
<tr>
<td>8</td>
<td>New Dredging</td>
<td>Excavation and removal of material from the ocean floor not to exceed 100 cubic yards below the plane of the ordinary high water mark or the mean high water mark from navigable waters of the US and; excavation and removal of material from the ocean floor within Navy controlled property. This does not include dredging or degradation through coral reefs.</td>
<td>2, 3, 4, 5, 7, 8, 9, 13, 14</td>
</tr>
<tr>
<td>9</td>
<td>Scientific Measuring Devices</td>
<td>The installation of devices which record scientific data (staff gauges, tide gauges, water recording devices, water quality testing and improvement devices and similar structures) on Navy controlled property. Devices must not transmit acoustics (certain frequencies) that will adversely affect marine life.</td>
<td>1, 2, 14</td>
</tr>
<tr>
<td>10</td>
<td>Studies and Data Collection and Survey Activities</td>
<td>Studies, data and information-gathering, and surveys that involve no permanent physical change to the environment. Includes topographic surveys, wetlands mapping, surveys for evaluating environmental damage, engineering efforts to support environmental analyses, core sampling, soil survey sampling, and historic resources surveys.</td>
<td>2, 3, 6, 8, 9, 11, 12, 13, 14</td>
</tr>
<tr>
<td>11</td>
<td>Demolition</td>
<td>Demolition and disposal involving buildings or structures when done in accordance with applicable regulations and within Navy controlled properties.</td>
<td>1, 11, 12, 14</td>
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<tr>
<td>12</td>
<td>Military Testing and Training</td>
<td>Routine testing and evaluation of military equipment on or over military, or an established range, restricted area or operating area or training conducted on or over military land or water areas in which the impact is not significant.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Real Estate/Property Transfer</td>
<td>Real estate acquisitions or outleases of land involving new in grants/out grants and/or 50 acres or more where existing land use will change.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Mission Changes</td>
<td>Mission changes, base closures/relocations/consolidations, and deployments that would cause long term population increases or decreases in affected areas.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Historic Buildings</td>
<td>Any activity proposed that would affect historical or cultural sites either listed on the National Register of Historical Places or deemed eligible for inclusion on the National Register.</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Limitation of Access to Property</td>
<td>Permanent closure or limitation of access to areas that were open previously to public use, such as roads or recreational purposes (provided the access is not required by established agreements with State of Hawaii, private industry, etc.).</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Integrated Natural Resources Management Plan (INRMP) Studies</td>
<td>INRMP implementation actions.</td>
<td></td>
</tr>
</tbody>
</table>

**Project Mitigation / General Conditions**

1. Navy controlled property refers to land areas, rights of way, easements, roads, ocean and naval defensive sea areas under active Navy control.
2. If any listed species enters the area during conduct of construction activities, all activities should cease until the animal(s) voluntarily depart the area.
3. Turbidity and siltation from project related work shall be minimized and contained to within the vicinity of the site through appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.
4. Dredging/filling in the marine/aquatic environment shall be scheduled to avoid coral spawning and recruitment periods.
5. All project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water shall be cleaned of pollutants prior to use.
6. No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.).
7. All debris removed from the marine/aquatic environment shall be disposed of at an upland site or EPA approved ocean disposal site, and Best Management Practices shall be followed.
8. No contamination (trash or debris disposal, alien species introductions, etc.) of adjacent marine/aquatic environments (reef flats, channels, open ocean, stream channels, wetlands, etc.) shall result from project-related activities.
9. Fuelling of project-related vehicles and equipment should take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored on-site, if appropriate, to facilitate clean-up of accidental petroleum releases.
10. Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.
11. Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric, etc.) after exposure and stabilized as soon as practicable (with vegetation matting, hydrosedding, etc.).
12. Section 106, of the National Historic Preservation Act (NHSPA), consultation requirements must be met. Also, follow guidelines in the area-specific Integrated Cultural Resources Management Plan (ICRMP) if applicable.
13. Project-related activities will not affect federally-listed endangered/threatened plant species.
14. The National Environmental Policy Act (NEPA) review process will be completed. Actions requiring an Environmental Impact Statement (EIS) are not covered by this de minimis list.
15. The training, testing and evaluation will be conducted in accordance with applicable standard operating procedures protective of the environment.
Ref. No. P-11712

April 2, 2007

Mr. C. K. Yokota, Director
Regional Environmental Department
Department of the Navy
Commander
Navy Region Hawaii
850 Ticonderoga Street, Suite 110
Pearl Harbor, Hawaii 96860-5101

Attention: Mr. Brett Chambers

Dear Mr. Yokota:

Subject: Hawaii Coastal Zone Management (CZM) Program Federal Consistency
Concurrence for Department of the Navy De Minimis Activities in Hawaii
Under the Coastal Zone Management Act

The Request for Concurrence with Department of the Navy De Minimis Activities under the Coastal Zone Management Act (CZMA) and list of Navy De Minimis Activities Under CZMA have been reviewed for consistency with the Hawaii CZM Program. The CZM Program conducted a thorough review of the request and a public notice of the CZM review was published in the State of Hawaii Office of Environmental Quality Control’s publication, The Environmental Notice, on March 8, 2007. The public was provided an opportunity to participate in the review through March 23, 2007. There were no public comments received.

It is our understanding that the Navy De Minimis Activities Under CZMA (hereafter referred to as Navy De Minimis Activities list) is subject to and bound by full compliance with the corresponding Mitigation/Conditions set forth in the Navy De Minimis Activities list. We concur that the listed de minimis activities are expected to have insignificant direct or indirect (cumulative and secondary) coastal effects and should not be subject to further review by the Hawaii CZM Program, on the basis and condition that the listed de minimis activities are subject to and bound by full compliance with the corresponding Mitigation/Conditions set forth in the Navy De Minimis Activities list.
The Hawaii CZM Program reserves the right to review, amend, suspend, and/or revoke the Navy De Minimis Activities list whenever it finds that a listed activity or activities will have reasonably foreseeable coastal effects. CZM consistency concurrence does not convey approval with any other regulations administered by any State or County agency.

Establishing the list of Navy de minimis activities for CZM consistency concurrence was a cooperative effort between our Office and Mr. Brett Chambers from the Department of the Navy, who interned with the CZM Program in December 2006. We appreciate the efforts of Mr. Chambers in working with our CZM staff to establish the de minimis list. The list will result in more efficient compliance with Coastal Zone Management Act federal consistency requirements for both the Navy and the Hawaii CZM Program.

If you have any questions, please call John Nakagawa of our CZM Program at 587-2878.

Sincerely,

Laura H. Thielen
Director

c: U.S. Army Corps of Engineers, Regulatory Branch
(w/ copy of de minimis list)